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ABSTRACT

A historical-comparative study of the sonorant system of Athabaskan, Eyak, and Tlingit, American Indian languages of Alaska, is presented. In this study, sonorants are considered as a class rather than as a constituent of the general consonant group. An opening section looks at the development of the generally recognized Proto-Athabaskan (PA) sonorants, and subsequent sections consider, in greater detail, specific PA sonorants, stem-initial sonorants, ablaut and nasalization in Athabaskan, stems with an internal sonorant or fricative, and Na-Dene sonorant systems (PA, Eyak, PA-Eyak correspondences, Tlingit, Tlingit/Eyak/Athabaskan correspondences, Na-Dene/Haida/Tsimshian). Appended sections explain transcriptions and abbreviations, and an index of the PA stems. Contains 143 references. (MSE)

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ALASKA NATIVE LANGUAGE CENTER
RESEARCH PAPERS

Number 5

ATHABASKAN, EYAK, AND TLINGIT SONORANTS

by
Michael E. Krauss and Jeff Leer

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This series of linguistic papers is published at irregular intervals. The papers deal with advances and problems in linguistic research and related Native American languages — Athabaskan-Eyak-Tlingit, Eskimo-Aleut, Haida and Tsimshian. The papers will often be of greater length than are normally published in journals. Many have been circulated informally among specialists in their fields before publication here, and are now made generally available for the first time.

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Michael E. Krauss

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0. Introduction

The present paper deals on a historical-comparative basis with the sonorant system of Athabaskan, Eyak, and Tlingit. Historical-comparative studies in this language group have tended to focus on the obstruent system alone, or on the consonant system including the sonorants, without treating the sonorants as constituting a class of their own. We have therefore only recently gained several important insights into the interactions between sonorants, and those between sonorants and vowels, and into certain types of stem-variation; also in the identification of cognates, and even in the identification of (forgotten or unnoticed) phonemes in both proto- and contemporary languages, especially the sonorant now represented as PA */ɳ/ (and also the still more recently distinguished PA */$ɳ_2$/).

In 1976 we circulated a preliminary (43-page) version of this paper[1], here very much revised and expanded. The present

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1. The first drafts of this paper were written in October-November 1975, entitled "Proto-Athabaskan *ñ," 11 pp., and "Proto-Athabaskan *ñ and the Na-Dene Sonorants," 41 pp.; a third was written in January 1976, with comments by Kari, Ritter, Story, and Pinnow; and a fourth more widely circulated version was written in May 1976, entitled "Proto-Athabaskan *ŷ and the Na-Dene Sonorants," 43 pp.

In the present version, Leer wrote all or most of sections 2.3, 5.1, 5.2, 6.3, 6.4, 7.4, 7.5, 7.6.2-3; both authors wrote large parts of 3.1 and 7.3.4; and Krauss wrote all or most of 0., 1., 2.0, 2.1, 2.2, 3.2, 4., 5.3, 6.1, 7.2, 7.3.1-3, 7.3.5, 7.6.1, 8., 9. The authors have reached agreement throughout, often heavily amended each other's sections, and are jointly responsible for all sections of the work. The authors are indebted to Victor Golla, James Kari, Heinz-Jürgen Pinnow, Keren Rice, John Ritter, Gillian Story, and Ron Scollon for careful readings of earlier versions of this paper, and helpful suggestions.

Explanations of transcriptions and abbreviations, as well as sources and references, will be found in the appendix-like final section of this paper.

version represents our thinking that has developed over the past five years or more on the subject of sonorants as such in these languages. We offer it in the hope that it may not only be of interest from a historical point of view, but that it may also be found useful even in the synchronic description and explanation of contemporary Athabaskan phonology.

It will be noted that whereas in Krauss and Leer 1976 the palatal nasal sonorant was represented as *ỹ, it is in the present version represented as *ŋ. *ỹ is phonetically the more appropriate symbol for the phoneme in final position, while *ŋ is more appropriate in initial position. (The same is true also for *w̃ and *m.) Unfortunately, there is no single convenient symbol which is appropriate for both [ỹ] and [ŋ] (or for [w̃] and [m]). The phonetics and reason for the new choice of symbols here will be explained in 2.1.2.2 (end), and at length in 7.1.

1.0 Development of the generally recognized PA sonorants *w *n *y

It is perhaps partly due to the uneven tendency for the PA sonorants to become obstruents in the modern Athabaskan languages that they have not been viewed before as a phonological subclass. We shall show this unevenness here by giving a brief survey of the development especially in stem-initial position of the sonorants that have been generally recognized for PA: *w, *n, and *y.

Of the three PA sonorants in question, PA *w has shown the strongest tendency to change, especially to occlusivity, either as a nasal sonorant, m, or oral obstruent, b. In fact it has remained [w] stem-initially only in Eyak, and in two now extinct varieties of Athabaskan, Kwalhioqua-Tlatskanai (written w consistently by all seven transcribers, never v or b/p), and the Seldovia dialect of Tanaina. It has otherwise remained non-occlusive, v, only in Tanaina (Iliamna and Nondalton-Lime dialects), Ingalik, and Kutchin. It is m in Holikachuk, Koyukon (Lower dialect), Upper Kuskokwim, Northern Tutchone (Mayo dialect), Sarcee, some PCA (Hupa; Tolowa-Tututni-Chasta Costa, Umpqua, i.e., all Oregon except Galice and Coquille). In Tanacross, the Selkirk dialect of Northern Tutchone, Southern Tutchone, Tagish, Slavey, Dogrib, *w › [mb, ^{m}b, m^{b}]; in each of these languages also *n › [nd, ^{n}d, n^{d}]. Elsewhere, i.e. in the majority of Athabaskan languages, stem-initial PA *w › b. (There may of course be many modern Athabaskan languages which have /w/ or [w] from other sources, such as loans, or PA /*γ^{w}/, or even /*z/ (Hare, Bearlake, Dogrib).)

In somewhat fewer of the modern Athabaskan languages, stem-initial PA *n has also become occlusive, as [nd, ^{n}d, n^{d}] (here without reference to whether or not that in fact contrasts with /nd/): Tanacross, Upper Tanana, Kutchin, Slavey, Dogrib, Northern Tutchone (Selkirk dialect), Southern Tutchone, Tagish, and Apache (not Navajo); or further, as [d]: Han, Hare, Bearlake, Beaver, Sekani, Tahltan, Kaska, Tsetsaut, Galice, Kiowa-Apache. It will be noted that except for Kutchin, this is a subset of the languages in which *w› [(m)b].

Of these three sonorants, PA initial *y has shown the least tendency to become obstruent in the modern languages. It has become /ž/ in Tanacross, Upper Tanana, Han, Kutchin, some Slavey, Dogrib, Northern Tutchone (both dialects), Tagish, and Kiowa-Apache. It will be noted that this is in turn a subset of the languages in which *n > [(n)d] (except for the Mayo dialect of Northern Tutchone). Otherwise *y has sometimes partially merged with *ɣ, before front vowels, at least in Apachean and Sarcee; in Tsetsaut it is x; but most widely it has remained [y].

We must point out that we have been discussing here the modern development of the PA sonorants in stem-initial position only, clearly the point of the most fortis articulation and also of the highest number of possible contrasts in the Athabaskan word. (Sonorant development in stem-final and prefixal position tends to be quite different, as will be demonstrated below.) Furthermore, we have above been describing stem-initial development of sonorants only in stems in which the vowel was <u>not</u> followed by a nasal in PA or PPA. In stems of the form RVN(') or RVN(ə)X[2], stem-initial sonorants have a strong tendency to develop otherwise (see table, 4.0): *w > m frequently instead of b (or w), *n > n always instead of (n)d, and *y becomes very unstable, frequently > n (see 2.1.2.2 below). (There are of course also occasional other marginal

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2. Where R symbolizes any sonorant, N any nasal sonorant, and X any obstruent (also C any obstruent or sonorant, V any vowel), henceforth throughout this paper.

instances of m in many modern languages, from diffusions, nursery terms, and/or exceptional forms such as Navajo mà'ì' 'coyote', Chipewyan -mą 'stink'.)

In stem-final (post-vocalic) position the development of *w *n *y has been very different again. PPA *w and *y are for the most part lost as such in absolute final position, although their features sometimes combined with those of the vowel (see 5.1, 5.3). PPA *n, on the other hand, is consistently replaced by nasalization of the vowel before an obstruent suffix (see 5.2, 6.4). *n and *y when followed by vocalic suffix have usually remained as such, and sometimes in absolute final position they have remained or tended towards voicelessness or breathiness along with obstruents (e.g. Ingalik, Koyukon, Tanana).

In prefixal position the sonorants have also shown far less tendency to change toward obstruence. Frequently, the opposite occurs, as where *qə-wə-, *qə-yə- > qu'-, qi'- or the like; rarely does *y > ž (e.g. some Slavey), or *n > (n)d~r (Mackenzie languages); even *w sometimes remains where stem-initially it is obstruent (e.g. Han wə- 3s.poss., postp. obj.; or *#wə- > #u-, e.g. in Ahtna, Upper Tanana, Carrier), or is m prefixally while it is b stem-initially (e.g. Tahltan, Kaska, Sekani, Beaver).

It may also be worth noting that many of those languages in which the PA sonorants have gone the furthest toward obstruentization (especially (m)b (n)d ž) are also those which have tended most to the weakening of stem-final consonants,

as through there is some correlation between increasingly fortis or obstruent articulation stem-initially and increasingly lenis or sonorant articulation stem-finally. (E.g., what is nəɬ 'wedge' in Koyukon is daw in Han, or cf. Koyukon dənigə 'moose', Han ʒəʒiw', ʒəʒu'.) Conversely, none of the languages still with stem-initial v n y or m n y have undergone severe stem-final consonant weakening, but in fact tend to be rather conservative in that respect, e.g. Tanaina, Koyukon, Upper Kuskokwim, Sarcee, Hupa.

1.1 PA stem-initial *w

We shall here demonstrate the development of stem-initial *w with a very few examples. For stem-initial *n and *y examples will be presented in 2.1.2.1 and 2.1.2.2. Examples of stem-initial *w in *wV(X) and *wVN are as follows:

*-we 'sg. swim' (usually mom. ipf. *-wé'-x̲, pf. -we'-ŋ̲, and cont. ipf. -we'): Ing., Tni. -vax̲, -van, Koy., Tna. -bax̲, -ban, At. -be's, -be'n, Kut. -vì', -vį', Han -bey, -min, Hare -bie, -mį, Chip. -bí, -bį, Sar. -móh, -mí, Tset. -be, K-T -we, Gal. -be', -be', Hupa -məW, -men, Mat. -bi'x, -bi'n, Kato -be, -bi'n, Nav. -bē'h, -bį'', KAp. -bé'h; Eyak -we; Tl. -hu.

*-wə̀t' 'belly': At. -bet', Tni. -vət', Ing. -vəd, Hol., Koy., Tna. -bəd, UK -mət', Tnc. -mbə́d, UT, STu. -mbə̀d, Kut. -və̀d, Han -bə̀d, Chip. -bə́r, Hare, Brlk. -bé' (bé', -béré' 'food'), Sl. -mbé', Dogr. -mɔ̀', Tag. -mbə̀d, Tahl.,

Sek. -bə̀d, Hag., Car. -bəd, Chil., Bvr. -bə́d, Tset. -bɛ Sar. -mì', Gal. -bai', Tol. -me'd, Hupa -mət', Mat. -bi'ɬ, BR -bɑt, Kat. -bət', Nav., W.Ap. -bǐd. Meaning also 'meat, food' in at least Kut., Hare, Chip., Tahl., Car.; Eyak wət' 'vomit'.

*we·š(^{w}) '(semilunar) knife': At. be·s, Tni. vaš, Ing. vaš, Hol., Koy. -bas, Tna. -baš, Hare bieh, Brlk. beh, Mt., Sl., Dgr. -mbeh, STu. mbər, Tag. mbes, Kas., Sek., Chip. bes, Bvr. be·s, Sar. mas, Nav., Ap. bé·š; Eyak we·gš-g; Tl. (Yakutat) wé·gš.

*wən 'lake': Ing., Tni. vən, At. ben, UK, Hol., Koy.(L) mən, Koy. (C,U), Tna. bən, Kut. van, Tnc. mən, UT, Han, NTu. man, STu., Tag., Kas., Tahl. mən, Tset. me', Sl. mɨę, Bvr. min, Chil. bən-y [bɨ·], Tol. -mən, Hupa mən-q'; Eyak ma·. Often with -q'(-əd) 'on' suffixed. Perhaps also related to *-wən 'fill with water'.

Other very widely attested stems with initial *w are *-wa 'white', *wa·t' 'sleeve', *-wə̀·ɢ 'raid', *-wə̀·l 'hang suspended', *də-we· 'mountain sheep', *-we·-č'^{w}e' 'mother-in-law, father's sister', *-we·ɣ^{w} 'boil', *wəs 'riverbank', *wəs(-ɬ) 'sled load' *-wə̀č', -wə̀š(-) 'cheek', *we·ɣ 'gull', *wəɬ 'sleep', *-wa·n'-ə, -ɣə 'edge', *wɨ̀·ɬ 'snare', *-wɨ̀·s- 'hammock', *-wən 'fill with water', *wən 'morning', *wən' 'hut', *-wə̀·s roll, round'.[3]

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3. Forms with unusual initial such as Nav. -mə̀·s 'round, roll (spherical)' constituting a doublet with Nav. -bə̀·s 'round, roll (circular)' do not reflect *m as opposed to *w, but presumably arise from different prefixal environments. See 3.2. for similar developments in Ingalik. Cf. also Kato náme '2(sg.) swim!', na·be '2(pl.) swim!'.

Sapir ordinarily represented the PA labial as *m, though perhaps with personal reservations from the start, especially within the context of his Na-Dene: "b, p', and p! were clearly not found in Na-Dene (b and p' are rare Haida sounds), m existed only doubtfully (Ath. m, whence b in certain dialects, is not equivalent to Haida m, but to Haida-Tlingit w), while w was certainly found" (1915.534). This suspicion surfaced again in Sapir's comparative Athabaskan class at Yale, 1936: "*m > Hupa, Nulato Ten'a, Sarcee m; Kato, Navaho, Chipewyan b; Ingalik, Kutchin, Kwalioqua β (Tlingit and Haida w: probably *m = *β)" and "*'m' (β suggested by Tlingit w, Ingalik, Kutchin, Qualhiotqua)" (class notes by Stanley Newman, Jan. 28 and Feb. 19, 1936); and in Sapir's PA consonant table: m crossed out, replaced by β (Newman notes, April 8, 1936); β in table, "*(m??)" below table (Haas notes, same date). However, this suggestion does not recur in the published representations of the PA bilabial by Sapir's students, Li (e.g. 1933.434, *m) and Hoijer, who also generally wrote *m. In fact, Hoijer sometimes suggested it might be *b: "m(b?) - Athapaskan had apparently only one bilabial consonant" (1938.76); "PA had only one bilabial consonant, which may be reconstructed as either *m or *b" (1960.964). Whatever questions there might have been about its phonetic characteristics, it is clear that Hoijer was not viewing the labial as part of a subclass but simply as a "consonant". Pinnow, however, in his first publication on Na-Dene, discusses "Urathabaskisch b (?m)" in the context of Na-Dene *[w, w̃] (1958.138, 147).

Finally, Krauss (1964.122) reconstructed PA(E) *w as a member of the class *w *n *y, without discussion, but of course partly in consideration of Eyak w, with which the Athabaskan regularly corresponds. Since 1964, the PA labial has been increasingly represented in the comparative literature as *w, but further discussion of the problem has not been published before now.

2.0 PA *ŋ

We now turn to the reconstruction of PA sonorants that have not generally been recognized, *ŋ and *m, dealing first with the former (2.), then the latter (3.). In the development of this paper, it was our recognition of the necessity for reconstructing PA *ŋ that led to our examination of the entire sonorant system as such. Accordingly, the reconstruction of *ŋ occupied a major portion of the earlier version of this paper.

It turned out that we were in part only rediscovering what Sapir already in 1914 had reconstructed as PA *ŋ. Sapir himself then apparently forgot about or abandoned his *ŋ, at least for PA if not for Na-Dene. We again recognized it first, as Sapir had, in the verbal prefixes of the form n~ɨ, especially the perfective, and then only later connected that with correspondences in stem-initial and stem-final position which should have been very obvious all along. (For a detailed history of this human comedy of errors, see 8.0, Retrospect.)

There has in fact long been an obvious need for reconstructing *ŋ in stem-initial and stem-final positions to account for correspondences n:y:ŋ (as opposed e.g. to n:n:n

and y:y:y) in Athabaskan languages for which the documentation has long been adequate for identifying correspondences. Where most Athabaskan languages have n, Carrier sometimes also has n, but sometimes Carrier instead has y, both stem-initially and stem-finally, as amply documented at least since 1932 by Morice. Though the published documentation of Ingalik by Chapman (1914) and Osgood (1940) is not expertly transcribed, it is also already sufficiently clear from these sources that Ingalik has both n and ŋ, contrasting unpredictably. It had somehow escaped Sapir's notice (and ours until 1977) that Ingalik, which Sapir in 1923 himself also documented, regularly has ŋ precisely where Carrier has y and other Athabaskan has n. There is a certain lesson in this irony, how for some reason we are often blind to the obvious, and arrive at understanding only intermittently and by tortuous or accidental means. Another lesson in this case may be that primary data provided by "disfavored" sources tend to get ignored, even where valid, by the scientific academe.

Stem-initially *ŋ̲ is ŋ in Ingalik (distinct from both n and y); in Carrier and Babine-Hagwilgate it is y (merged with y < *y); and in Kutchin it is nʒ as distinct from nd, but only before PA reduced vowels and *a·, when not followed by nasal. Otherwise in Kutchin, as in the other Athabaskan languages generally, PA stem-initial *ŋ̲ has merged with *n. (Another exception, however, occurs in some instances where PCA languages show a labial reflex; see 3.1.)

Stem-finally PA *ŋ is distinct somewhat more widely than stem-initially: ŋ in Ingalik, y in Carrier and Babine-Hagwilgate, and ỹ, distinct from both n and y, in Kutchin (after all vowels), and in Han, Tanacross, and Upper Tanana (after reduced vowels only). In other Athabaskan languages PA stem-final *ŋ is merged with *n. The pre-PA perfective suffix to verb stems was also *-ŋ, which appears as such with open stems (CV), but here the correspondences are somewhat different from those for non-suffixal stem-final *ŋ.

In conjunct verbal prefixes the reflex of PA *ŋ is distinguishable probably in most Athabaskan languages in the form of alternations between n (Ingalik ŋ) and ɨ (or i), specifically in the 2nd sg. subject pronoun and in the perfective marker.

In the subsections that follow, the development of PA *ŋ will be documented first for stem-initial position, then stem-final position (and perfective suffix), and finally prefixal position.

There are also clear traces or probable vestiges of distinct reflexes for PA *ŋ in stems in various other languages: Holikachuk, Chilcotin, and Kwalhioqua-Tlatskanai, and clear record of an obsolescent nasal for stem-final *ŋ in Carrier, all to be discussed in 2.4.1-4, the final subsections on PA *ŋ.

In the process of revising the present paper it became clear that we must account for not one set of stem-initial correspondences for *ŋ, but two sets: not only the one with

Ingalik ŋ, Carrier and Babine-Hagwilgate y, all other Athabaskan n, but also another, similar to the first, Ingalik ŋ, Carrier and Babine-Hagwilgate y, and most other Athabaskan n, but Kwalhioqua-Tlatskanai and PCA, especially California, in which at least four of these stems show a labial reflex. For the present we shall deal with both sets under the one heading of *$\underline{ŋ}$, recognizing the second abstractly, as "*$\underline{ŋ}_2$", to consider later in this paper (3., 4., 7.), in more concrete reconstruction, as *m and/or *$\underline{ŋ}^w$, for *$\underline{ŋ}_2$.

2.1.1 Stem-initial *$\underline{ŋ}$

Instances of stem-initial *$\underline{ŋ}$ now follow:

PA *$\underline{ŋ}$ən 'you' (independent pronoun, sg.): Ing. ŋən, Hag. yən, Car. nyən, Kut. nan, Chip. nən, Tol., Hupa nən, Nav. nì; Eyak 'i', Tl. wa'e (wa- possibly fossilized prefix). Car. ny- only in this case. Nav. ‹ *$\underline{ŋ}$ən with loss of -n.

PA *$\underline{ŋ}$ən' 'land': Ing. ŋən', Hag., Car. yən, Kut. nan, Chip. nén, Hup. nən', Nav. nì' (cf. 'you'); Eyak yą'' (preverb) 'down', Tl. yan 'shore'. Probably related to following.

PA *$\underline{ŋ}$e'n' 'moss': Ing. ŋan' ('earth', taẋ-ŋan' 'swamp moss'), Hag., Car. yin, Kut. nɬą'. Probably related to preceding; Chip. nén 'moss' as well as 'earth', as in other Mackenzie languages. Kut. does not develop -d- or -ʒ- obstruence with nasal when nasal follows in stem, as e.g. here, 'land', 'you', 'across', 'drink', 'face'; the vowel i also follows generally where vowel is full and the syllable was originally closed.

PA *-ŋ̇e·z 'long': Ing. -ŋaθ, Hag. -yiz, Car. -yiz, Koy. -nał, Tna. -naθ, UT -niah, Kut. -nʒ̀a , Chip. -nɛ́ð, Hare -die, Tol., Hup., Kas. -nes, Mat. -ne·s, Nav. -nè·z, K-T -nez- (also -lez-, see 4.4). Adjectival form sometimes reduced, *-ŋəs seen in Ing. -ŋəθ 'long', Koy. -nəł (see fn. 26).

PA *-ŋəs-t'e' 'body': Ing. -ŋəθt'a' ('male'), Hag. -yəst'e, Car. -yəst'e, Tol., Hupa -nəst'e', Koy. -nəłt'a', At. -nest'e' ('old man'), Tni. -nəst'a, K-T -nəst'e', Gal. -dast'e'. Perhaps prefixal, or reduced stem. Cf. 'long'.

PA *-ŋa·t' 'fish meat': Ing. -nod, Car. -yad, Kut.-nʒid ('flesh which is eaten', Sapir), Tanaina -nut', Aht. -na·t'; Eyak k'iya't'. Ingalik is irregular. The form in Athabaskan is generally preceded by the reflexes of *ḵ'ə- indefinite possessor, thus *ḵ'ə-ŋa·t'. The Eyak, to be exactly parallel, should be *k'u-ya't', but synchronically is instead a monomorphematic unpossessed noun, phonologically canonic in shape as a "broken" stem (see 6.1); historically, however, it is clearly cognate to the Athabaskan, with trivial prefix vowel shift *u > i/__y. Unfortunately, no clear cognates are attested in PCA. However, the Eyak -y- here suggests that this stem is not related to PA *wə̀t' 'belly', which very widely throughout Canada , as noted, means also 'meat'.

PA *ŋəl(-i·) 'white-winged scoter': Kut. nʒa·, Tnc. ndəl, UT nal, At. neli. (Cf. 'flicker' below.)

The following two stems are of extraordinary interest; they also occur widely in well-established compounds. They will be documented in some detail because of the complexity of the development in the compounds (due in part to the instability of these as such, with tendency to be treated as "broken" or disyllabic stems, see 6.). Because of the labial reflexes of this sonorant in K-T and PCA, it is here reconstructed as *$\underline{ŋ}_2$.

PA *$\underline{ŋ}_2$əł 'wedge': Ing. ŋəł, Kut. nƺah, Hag., Car. yəł; At. neł, Tni., Koy., Tna. nəł, Tnc. ndəł, UT nał, Han daw, NTu. ndaw, Chip. -neł (Petitot), Slave 'ede, Tol. nəł, Nav. nīł; Lassik <u>biltco</u> 'elkhorn wedge' (Essene); Eyak wəł; Tlingit yi^s. Also Kato <u>ke bûl</u> 'knife', Mattole <u>gé'bil</u> 'butcher knife', Kwalhioqua <u>tsā'wił</u> 'stone axe', and California forms for 'yellowhammer' below.

PA *cə-$\underline{ŋ}_2$əł 'stone axe' < *ce'-$\underline{ŋ}_2$əł: Ing., Hol. θ̂əŋəł, At. cedneł, Tni. cansnəł, Koy. ƛaƛił, UK çaçənəł, Tna. θ̂aθ̂ił, NTu. teθ̂yan, teθ̂yaw, Hare gofɨ, Brlk. gəkwɨh, Sl. θ̂ɨh, Chip. θ̂ɛł, Tahltan cił (Thorman, Morice), Sek. ceł (Morice), Bvr. cɨł (Young), Sar. cił (Young), Car. çeçeł (Young), Hag. ceł, Chil. ĉinł [c^{ə}ɨł], Kwalhioqua tsā'wił (Teit, see 2.4.4.), Umpqua senəł (Hale), Tututni <u>sĕnĕł</u> (Curtis), Nav. cénīł. Note that in many cases the *ce'- is reduplicated. Tlingit ta-yi^s, hence Eyak təwi's.

PA *nə-čə-$\underline{ŋ}_2$əł 'flicker, yellowhammer' (first element 'nose, beak', *nə-čɨ'$\underline{x}$- < **nə-čən-g-): At. ceneł, Tni. (Upper), Koy.,

Tna. cənəł, UK nəcənəł ("Steller's jay"), Koy. (Lower) dəciłnəl, Tnc., At. (Mentasta) nci'ł, UT nʒi'ł, Kut. cią', NTu. 'ecána, Chip. 'ecale (Legoff, Petitot), Hare cene (Petitot), Dgr. cen (Petitot), Sl. neceníh, Car. 'inʒił, ChC. Dasnáł (Sapir); undoubtedly also California *wə-n-čį'x̲-ŋ̲$_2$əl-i', Hupa mîn-chuw̆-mil 'yellow-hammer' ("its nose taps", Curtis), Lassik bŭntcīsbŭl (Essene), Wailaki bŭn-chis-bîl-cho (Essene), Kato bŭnch-bŭl (Curtis), bŭntcbŭl (Essene). Non-California forms all with 'nose' reduced, perhaps very old compound before development *-čį'x̲; see also 6.4. (See Addenda, p.206, for further data.)

PPA *-ŋ̲$_2$əł (PA pf. *-ŋ̲$_2$əl) 'spill, pour, sprinkle, pl. fall, handle pl.': Ing. -ŋəł, Kut. -nʒa', Hag., Car. -yəl, Tni. -nəl, Chip. -nəl, Tol. -nəł, ChC. -nɑ̨ł (Sapir ledger), Nav. -nîl, Mesc. -ndîl, K-Ap. -nîł; Hupa -məł, -meʌ' 'throw pl., scatter', Mat. -beł, -bel 'throw rope', Kato -bil , -bûl, -bûL 'to fall, rain, sprinkle (pl.)', probably also Kwalhioqua .shwū'lɛwił 'cup' (Teit, see 2.4.4); Eyak -'ił 'spill, pour'. The Hupa and Kato glottalized perfectives are difficult to explain.

PA *tə-ŋ̲$_2$əł 'vessel' (probably < tə- 'forth' + 'pour', often compounded, e.g. Northern *tu'-təŋ̲$_2$əł '(water) cup', PCA (q'ay'-)təbəł '(basket) vessel': Ing., Hol. təŋəł, Koy. tił, At., Tnc. -ti'ł, UT -tį'ł, Tna. tənəł, Han čin', Kut. tiąh, NTu. tyan, Hare, Brlk., Sl. tene, Chip. təli, Hag.,

Car. tił, Chil. tənəł, tɨł, Tol., Tut. tŭhl (Curtis); Hupa -tîm-mĭhl (Curtis), BR tabbał, Lassik tŭbuł- (Essene), Wail. tŭ-bŭhl (Curtis), Kato tbûL (Goddard), -tbŭhl (Curtis), -tŭbuł (Essene), -t'bûL (Sapir).

The following two examples also show northern *ŋ, with labial cognates in PCA.

PA *-ŋ$_2$əʒ 'pluck': Ing. -ŋəʒ, Hag. -yəʒ, Car. -yəs, Kut. -nʒo', At. (Upper) -nəʒ, (Lower) -noʒ, Tni. -nəʒ, UK -nəʒ, Chip. -nɛz, Nav. -nĭž; Koy., Tna. -nʊʒ, Tnc. -ndoʒ, UT -nod; cf. Hupa -məʒ 'pull, snap off'. The vowel in At. (L), Koy., Tna., Tnc., and UT is irregular for *ə, clearly reflecting, however, the same labiality or rounding as in Hupa m. Cf. 'fly' in 3.2.

PA *ŋ$_2$a'n' (directional and postpositional stem) 'across' (body of water, or e.g. road, not e.g. mountain): Ing. -ŋan', -ŋo-, Tni. -nun, At. -na'ne, UK, Hol. -nan', Koy. -nan', -no-, Kut. -nĭn, Han n-nǎn', Tag. -nǎn ('over there', Marsh), Chip. -ná, Sar. -nǎ'-, Car. n-yan, Hag. ye'n ('bridge'), Tol. mane, mą', Tut. mane (Golla), Hupa o-man'-ə ('opposite o'), yə-man-ə 'across the stream on the opposite bank', BR yəban, Kato yĭbañ 'other side', Nav. (-)nǎ'. Also frequent without final *-n(ə), with suffixed *-č'(ən') 'towards', as reflexes of *-ŋ$_2$a'-č'-. Note also Tut. m for this form, but n in 'wedge', 'pour'. Locative, e.g. 'across (river)', Ing. eŋan', Hol., Koy. yunan(ə'), Tna. yonǒnǎ', Kut. 'o'nĭn, ye'nĭn, Chip. yɥná, and the PCA forms

above with yə-. As a disjunct verbal prefix, however, the PA form implied is always *na·n̓ -, *nạ̀·-, Ing. no-, Hag. ne-, Car. na-, K-T nā·āwe 'to swim across' (Teit), Hupa, Kato na-, Nav. nà·-, Chip. nạ́-, Koy., Tna. nǒ-, except perhaps for Hare nié- (not > r-).

2.1.2 Contrasts with stem-initial *n, *y, *ɣ, *Ø (=h)

2.1.2.1 Stem-initial *n

Contrast of PA *n̲ with PA *n is easy to demonstrate for stem-initials. We shall restrict ourselves to a very few instances of PA stem-initial *n.

PA *nu· 'island': At. nu·, Tni. ni, Ing. ne, Hol., UK, Koy., Tna. nu, Tnc. ndu·, UT nu·, Kut. nʒu·, STu. nʒu, NTu. (Selkirk), Dgr., Sl. ndu, Tahl. -du-, Sar. nu·, Chip., Chil., Hag., Car. nu, Hare, Brlk. du; perhaps Eyak lu· '180° turn; tide'; Tlingit nu^w 'fort or flat-topped defensible island'.

PA *-nè·x̣, -nè̀q' 'swallow, choke' (ipf. & pf.): At. -ne·x̣, -naq', Tni. -nax̣, -nəq', Ing., Koy. -nax̣, -nəɢ, Kut. -nʒɪ̀·, -ndàg, Hare -de, Chip. -né, -náɣ, Tset. -dɛ, Tahl. -de, -dəg (Morice), Car. -neh, -no (< *-nəɣ), Sar. -nàh, -nɪ̀k', Hupa -nəw, -nəq', Nav. -nè·h, -nà'; Eyak -'ni·q'.

PA *-ni·x̲, -nì·g̲ 'move hand to' (mom. ipf. & pf.): At. -ni·s, -ni·g, Tni., Koy., Tna. -nix̲, -nig, Ing. -nex̲, -neg, UK -niš, -niʒ, Kut. -nʒi·, -nʒɪ̀g, Hare -di, Chip. -ni, -ní, Car. -nih, -ni, Gal. -ni·, -ni', Hupa -nʊg, Mat. -nix̲, -nid̲, Nav. -ní·h, -nɪ̀·', Mesc. -ndí, -ndɪ̀·; Eyak -le·g^w; Tlingit -nig^w 'feel'.

PA *-ni˙, -ni' 'say' (ipf. & pf.): At. -ni˙, -ne', Ing. -ne, -ne', Tni., Koy., UK, Tna., Car. -ni, -ni', Kut. nia˙, -nɪ̀a', Chip. -ni, -ní, Gal. -ni˙, -ni', Hupa -ne, -ne', Mat. -ne˙, -ne', Nav. -ní, -nɪ̀˙d, KAp. -ní˙, -nɪ̀'; Eyak -le.

PA *-na˙$\underline{ŋ}_2$ 'drink' (durative ipf.): At. -na˙n, Tni. -nun, UT -nǫ˙, Han -næ˙, Kut. -nɨ˙, Chip., Hare, Bvr. -dą, Hag. -ney, Car. -nay, Sar. -dó(n-), K-T -na(n-), Ump. -na (Harrington), ChC., Gal. -na˙, Hupa -nan, Mat. -na˙n, Kato -naŋ, Nav., Mesc. -d-lą́, KAp. -d-lą̀˙; Ing. -nen, Hol., Koy., UK -nun, Tna. -nʊn; Eyak -la; Tl. -na. Throughout with də-classifier (including Eyak and Tl.); initial deleted in Chip. and Ap. (with double classifier d+ɬ-). Vowel in Ing., Hol., Koy., UK, Tna. irregular; see 3.2 for discussion.

PA *-(nə-)ne˙n' 'face': At. -ne˙n', Tni., Ing., Hol., Koy., Tna. -nan', UT -nɨ̀˙, Han -enɨ̀', Kut. -nɪ̀n˙, Hare, Brlk. -ní', Chip. -n-né, Hag., Car. -nin, Sek. -nè', Bvr. -nɨ́˙', Tahl. -ni (Morice), Tset. -ne˙, Sar. -nɪ̀', K-T -ne˙n', Gal. -ni', Hupa -nən', Mat. -ni', Nav., WAp. -nɪ̀˙', KAp. -nɨ̀˙.

The correspondences for stem-initial n quite clearly differ from those for *$\underline{ŋ}$, at least in always showing apical point of articulation. The initial in *nVN ('drink', 'face') always remains n, while in *nV(X) it may undergo varying degrees of obstruentization, to nd or d.[4]

4. There are some complexities in degree of obstruentization in that the initial of verb stems of the form *-nV(X) sometimes also remains n in languages in which n > nd or d in the initial of nouns or other verb stems of the form *-nV(X), as here in 'move hand' (e.g. Gal.), and especially 'say' (most languages). These complexities remain a subject for further investigation.

Further examples of very widespread *n stem-initials are as follows: *-na· 'move (part of body), be alive, safe', *-na·t' 'lick', *-ne·-x̣ 'act, happen' (ipf.; pf. *-(y)å·ɢ), *nu·nə 'animal', *-yə-ne· 'mind', *-nə-ni·k' 'nostril', *-na· (ablauting to *-ne·, < PPA *-na·y) 'move camp'. Forms with prefixal -n- 'face, head' also remain n, not > nd. Certain other well known forms, e.g. *də-ne· 'person', *nå·-t(V)- 'two' often also fail to develop regularly where *n is not treated as stem-initial.

2.1.2.2 Stem-initial *y and *y̲

If one disregards the evidence of the prefixes and that, to be presented further below, of the stem-finals, conclusive proof of stem-initial contrast between PA *ŋ and *y is a more complex matter than proof of stem-initial contrast between *ŋ and *n, for the following two reasons: (a) the problem of sorting out the developments of three partly confused stem-initials, *y, *y̲, and *Ø; and (b) the argument that *ŋ is an allophone of *y where the stem-vowel was followed by a nasal, i.e. that *y (or Ø, *y̲) > *[ỹ]/___VN(X).

We shall consider argument (b) first. Four of the eleven examples of stem-initial *ŋ ('land', 'you', 'moss', 'across') also show overt stem-final *n, in fact. Aside, again, from the evidence in the prefixes and stem-finals, one obvious proof against this argument for stem-initials is to find correspondences for PA stems of the form *yVN which contrast with *ŋVN. This is possible but complicated in that it brings us back to problem (a), sorting out PA *y,

*$\underline{\gamma}$, and *Ø; however, when the sorting is done, there are at least three cases left of *yVN, the correspondences for which contrast with those for *$\underline{n}$VN.

In PA there may still have been a clear contrast between *y, a member of the sonorant system ([+cons, +voc]), and *$\underline{\gamma}$, a member of the obstruent system ([+cons, -voc]). *y was thus taxonomically closely related to *$\underline{n}$ and *n, but not to *$\underline{\gamma}$. Though phonetically similar to *y, *$\underline{\gamma}$ was the voiced form of the fricative *$\underline{x}$. PA (but not PPA or PAE) fricatives were automatically voiced intervocalically, by a rule with very natural phonological motivation, but, except for absolute initial position, they were also voiced stem-initially, possibly by a morphologically motivated rule, as especially in verb-stems, in some languages even after voiceless obstruents (e.g. the ł classifier). PA stem-initial *$\underline{\gamma}$ and *y can clearly be distinguished in the environment VN, where, as we shall see, *$\underline{\gamma}$ is never affected by nasality, whereas *y usually is. On the other hand, *$\underline{\gamma}$V(X) and *yV(X) are always merged, perhaps since PA times. They are easily distinguished morphophonemically within Athabaskan, however, as whenever the stem can be found in absolute initial position, the former is always voiceless, a reflex of *$\underline{x}$, and the latter is always voiced, y (or ž). They are clearly distinguished in Eyak also, as x and y. Some stems with initial *y are *ya' 'sky', *ya' 'louse', *yəxd 'house' (see 6.3), *yəxs 'snow' (see 6.3), *-ya'ž(^{w})- 'little', *yəš(^{w}) 'wolf', *yu' 'beads, clothes'; and three of the form *yVN, to be

examined below. Some with initial *-ɣ are *-ɣəc'- 'hill' (cf. *x̲ə́s, and probably Eyak ɢəɬəxəc'ɬ placename for a hill), *-ɣʊʌ' 'blow' (Eyak -xu'ʌ'), *-ɣa'č' 'knot' (cf. *x̲a'č', Eyak -xa'č), *-ɣa'ɳ 'grow' (Eyak -xa), *-ɣən 'sing shamanistically' (*x̲ən 'shaman's song', Eyak xi'l 'shaman'). For the present purposes we shall restrict ourselves to documenting the latter two stems, which end with a nasal.

PA *-ɣe'(-x̣)/ɣa'ɳ 'grow' (ipf./pf.): Ing., Koy. -yax̣/yon, At. -ye'x̣/ya'n, Tni. -yax̣/yun, Kut. -z̲ɬ'/z̲ɬ', Car. -yeh/yay, Chip. -yɛ/yą, Sar. -ɣá/ɣá(n-) (with ɬ-, -šó/šó(n-)), Nav. -ɣé/yą́, Hupa -yəw/yan; Eyak -xa. Irregular correspondences for associated neuter *-ɣa'ɳ ~ *-ɣa'n 'be mature, old, wise, sensible' in Car. -yan, but Hag. -ye (for -yey?), Sar. -yá(n-), K-T -ya'n, -ya'l (see 2.4.4), elsewhere like pf. of 'grow', and noun *ɣa'n(-ən) 'old age, old person', Kut. s̲in, Car. ʒ̲an, Nav. są́(ní); Eyak xa'nih 'very old salmon'; cf. Tlingit -šan 'become old, get gray hair', ša^n 'old age, old person'; with Eyak xa'nih compare also Tl. xe^n 'dying salmon with white spots' and -xen 'get scabby'.

PA *-ɣən 'sing shamanistically' (sometimes attested only in *də-ɣən-ən, relativized nominalization, 'shaman'): At. -yen, Ing. -yən, Kut. -žan, Nav. -yı̨̀n, Tol. -in-, Car. -yən, Sar. -yin. Cf. also widespread Athabaskan *ɣən, *-ɣən-ə' 'shaman's song' (e.g. Nav. sı̨̀n, -yı̨̀'n, Chip. šən, -yən-é); Eyak xi'l 'shaman'. Cf. Tl. -san 'cure shamanistically'.

Note that in these cases of stem-initial *$\underline{\gamma}$, even where the final nasal in 'sing shamanistically' is an integral part of the stem separated from the initial only by *ə, the obstruent initial remains totally impervious to nasalization.

It is more germane and difficult to find examples of PA *yVN to contrast with *$\underline{\eta}$VN. Examples of PA stem-initial *y are not rare, and correspond to Eyak y, e.g. *-ya·ž$^{(w)}$-ə '(woman's) child', Eyak -yahš. Several cases of stem-initial y in Athabaskan and Eyak arise from *Ø, to be discussed below. So far only three stems have been clearly identified as being of the form *-yVN, contrasting with *$\underline{\eta}$VN, *-$\underline{\gamma}$VN, and also *-ØVN. The initial y of these three stems becomes nasal in most Athabaskan languages, usually n; the Ing. forms imply initial *$\underline{\eta}$, and the Carrier and Babine-Hagwilgate *$\underline{\eta}$ or *y; however, Ahtna, Tanaina, UK, Kwalhioqua-Tlatskanai regularly show still explicitly y (and several other languages show y in one or more of these forms), yielding a set of correspondences that clearly reconstruct PA *yVN as opposed to *$\underline{\eta}$VN or *$\underline{\gamma}$VN. The instability of this initial *y is especially striking in PCA and Apachean, where the reflexes imply not only *y and *n, but also even *w or *m.

PA *-ye·n 'sharp' (stem generally neuter where available, always with thematic də- prefix): Ing. da-ŋan, Koy. da-yan or da-nan, Kut. ʒ̓ī·-nin, Han ʒ̓ēhnay (metathesis?), Hag., Car. γəndə-yin, At. de-ye·n, Tni. -yan, UK da-yah ('dull'), Chip. dé-nɬ, Tahl. 'ɐdédenī·n, Chil. -də-ni (Morice, 'émoussé'), Gal. di·-mi·, Mat. dɪdɪ-bi·n, Hupa də-men,

Nav. dè'-ní; Eyak x̣ədi'-yąh; note also Nav. dĩbį̀h 'pointed sword-like instrument' (in Sapir ledger, "archaic", also Haile 1950 [illegible]off.), dãhsání 'porcupine', (-s- < *-ł-y-). Eyak x̣ą'gudi'yąh 'porcupine', di'yąh 'stickleback' (neuter nominalizations < PAE **də(-')-ǫ̲i-ye'n, [di'yąh, dį'ỹąh, dį'ñąh]), and Tlingit ya-ye'n-a^ 'whetstone'.

PA *-ye'n, *-yən- 'spine, back': Ing. -ŋan- (also gə-ŋən 'fish spine'), Koy. -nənə', Hol. -nan-, UK -yi'-, Kut., Han -nàn', Tnc. -nán'', UT -nį̀h-, NTu. -nín-, Hag., Car. -yən, At. -yene', Tni. -yəna, Chip. -nənɛ́, Hare -néné', Sar. -nínà', Chil. -nən (Morice), Sek. -yine' (Young), K-T -yəne', Hupa -e'n', -n-, Gal. -i'ne', Mat., BR, Tol. (Goddard) -ine', Nav. -í'-. Often attested only in compounds, or reduced to prefix status, where it then resembles the perfective and 2sg. prefixes described above.

PA *-ya'ǫ̲ (stem in *q^{w}ənɛ̀'zya'ǫ̲ 'ten'): Hare honénǫ, Brlk. horéno, Sl. hono, Chip. honénąˀ (Young), Sar. kuneeznáníh /kunàznóní/ (Young), Chil. łč'áẑnan, Tahl. c'osnan, Hag. γ^{w}ənize, Car. x^{w}ənizyay, -ya-, K-T k^{w}ənešyən, -ya-, Ump. whuneya (Tolmie), kwəneza (Hale), x^{w}əne'za (Harrington), Gal. k^{w}e'sai, Tut. (Ch.C.) x^{w}é'sɛ, Mat. nisiyá'n, Nav. nè'zná', W.Ap. gonèznáń, Chiricahua gonè'snán. Very widespread form (Hare to Apache); stem to be reconstructed -ya'ǫ̲, especially on the basis of Carrier and K-T, Mattole. The initial -n- is regular in the rest of the Canadian languages and Apachean, but in Oregon the initial seems

usually to delete. The final, perhaps a perfective suffix, also irregularly drops or remains as y in Oregon. The prefixes, usually regular for *q^{w}ə- 'place, event', nə- thematic with s-perfective, are different in Chilcotin ('double') and Tahltan. The tendency to irregularity in stems of the form *yVN is probably further increased by the status of these forms as a numeral. The stem-initial was perhaps originally *Ø (=h), and y in this s-perfective (as also in e.g. 'sg. goes'). Perhaps to be identified with *-he', *-ha'ŋ 'win at gambling' (often *q^{w}ə-nə-ɬ-, perhaps causative of theme lexicalized in 'ten'); see 2.1.2.3. Cf. also (Lime Village) Tanaina (k'-)d-gh-lun 'to make a set of one hundred' (< *-ɬ-ha'ŋ ?).

Notwithstanding the contrast just demonstrated between *yVN and *ŋVN, it might still be tempting to argue that, at least in the case of obstruent-closed stems, *ŋVX could be derived from an earlier *yVNX by way of vowel-nasalization. However, this interpretation too is rendered unlikely by the fact that when an obstruent suffix is added to a stem of the form *CVN(ə), the resulting nasalized vowel is consistently long, even if the original vowel was reduced, as in *-wən-ɬ > *-wį'ɬ, fut.-prog. of *-wən 'fill with liquid'. Thus a stem of the form *yVNX would be expected to develop a long vowel by the process of nasalization, but some of the examples given above have reduced vowels ('wedge', 'spill', 'pluck', 'scoter', 'body'). There

does not seem to be any evidence to suggest that the reflex of *CV(R)-X should differ from that of *CV(R)X (see section 6.3, 6.4), so that it seems highly unrealistic to derive *ǫəX from *yəNX.[5]

Finally, another type of minimal pair for PA *ǫVN and *yVN might be cited in the prefixes *ǫə- 2s. possessor and *yə- 4th person possessor with a stem such as *-(h)a'n 'mother', which, given h = Ø, may be represented *ǫa'n and *ya'n, reflected as na'n and ya'n or the like in many modern languages.

The most precise formulation of the status and relationship of PA *y and *ǫ must be that they contrasted even in __VN, but that here *y → [ỹ], which then contrasted with /*ǫ/ by being non-occlusive. Thus stem-initially [*ỹ] was an allophone of /*y/ in *yVN, whereas stem-finally (i.e. in V___$\overset{\#}{C}$), [*ỹ] was an allophone (in fact the usual realization) of /*ǫ/. Note (Table, 4.) that the reflexes of PA *ǫ remain orally occlusive stem-initially in all Athabaskan languages (except for Hag.-Car. y), whereas stem-finally, where not merged with and sharing the fate of *n (itself often nasalization of vowel), *ǫ is orally occlusive

5. There are certain Eyak-Athabaskan correspondences which perhaps imply PAE stems of the form **CVNX or *CVX, where PA had a reduced vowel, e.g. Eyak łąhd 'smoke', PA *łəd (for further examples see 7.3.3, p. 142). It is quite possible that the nasalization in Eyak is an innovation; even if the nasality was present in PAE, it was apparently gone by the PA stage. The exact nature of the nasality and the process by which it disappeared would require further investigation.

only in Ingalik, elsewhere [ỹ] or [y]. For further discussion see 7.1.

2.1.2.3 Stem-initial *Ø (=h)

PA stem-initial *Ø was equivalent to *h; phonetically [Ø] appeared after a consonant, presumably [h] elsewhere, except that after *i and *u [Ø~h] was replaced by epenthetic [y] or [w], respectively, as was shown by Krauss (1969.61-64, 70) especially in his treatment e.g. of the perfective, *-ya', of PA *-ha' 'sg. goes'. The development of PA *h~Ø is rather complex, affected by analogy, and somewhat unstable in many languages (note e.g. the Ahtna possessed forms for *-ha'n 'mother' listed below). Only a few languages are attested as still retaining [h] in at least some cases: Koyukon, Ingalik, Kutchin, Upper Tanana, K-T (?), probably more. Others, where not replacing *Ø~h with epenthetic sonorant, may develop -x̣-, -ɣ-, or -'-, or elide the sequence, e.g. Tanana son 'my mother'. Eyak has lost the *[h], replaced by Ø and elision after ə, by y and w after i and u, as in ɢəxa'ɬ 'I walk along', 2s. ɢi'ya'ɬ, 3s. ɢa'ɬ; and in two cases perhaps replaced by -x̣-: -x̣əwəx̣ 'older brother', and x̣-a 'eat', where -x̣- is now (or as originally) a thematic prefix (see below).

Here we shall take only one example with obstruent stem-final, and list more fully especially those with stem-final nasal, which are of course the most difficult and important

to contrast with *ŋ̲VN and *yVN.[6]

PA *-(h)a(ˀ)d- 'older sister': Ing. -oda, Koy. -(h)oda, Kut. -eˀɮ̌iˀ, Han -aɮ̌eˀ, Tnc. -aˀde, Car. -yad, K-T -aˀde, Nav. -ádí, Sar. -dá, Chip. -arɛ, Hupa -adə, At. -adeˀ, Tni. -uda; Eyak -(y)əd-kih 'man's sister', with diminutive suffix, underlying stem -əd-: 'my s.' si-yəd-, 'your s.' 'i-yəd-, 'his s.' 'u-wəd-, but e.g. 'our s.' qaˀ-yəd-, 'your (pl.) s.' ləx̣-yəd- preferred to qaˀ-wəd-, ləx̣-wəd-, though both acceptable.

PA *-haˀn 'mother': Ing. -(ŋ)on, Koy. -(h)on, Kut. -han , Han -næˀ, UT -nąˀ, Tnc. -naˀ, Chip. -(x)ą, Hag. -en, K-T -(h)aˀn, Nav. -má (cf. Eyak), WAp. -ą́ˀ, Hupa -a, Tni. -un-gda; an example of variation within languages: At. (Central) snaˀn 'my m.', inaˀn 'your m.', ubaˀn 'his m.', neˀaˀn 'our m.'; Eyak -ąˀ: 'my m.' si-yąˀ [siyąˀ, siỹąˀ, siñąˀ, siña̱ˀ] or (childish) si-maˀ, 'your m.', 'i-yąˀ, 'his m.' 'u-maˀ (< *'u-wąˀ; hence, analogically si-maˀ and Nav. -má), and 'our m.' qaˀ-yąˀ preferred to qaˀ-maˀ, etc., cf. 'older sister'. See Hoijer (1956), items 14, 15, 16, 17, which are to be thus related, all with various epenthetic initials, -ŋ-, -m-, -n-, -b-, -'-.

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6. Other widespread stems with *Ø (=h) initial are PA *-haˀ 'for', *-haˀž(ʷ)ə 'cross-sibling's child', *-(h)u(ˀ)nəɣə 'older brother' (see 7.5), *-huˀs < *-həwəs 'stretch, pull' (see 6.4), *-leˀ, *-laˀ < *-ɬ-hay, -haˀy 'handle pl.', *qə-nə-(h)eˀ-x̲, -(h)a' 'speak', and perhaps also *-neˀ, *-naˀ 'move camp', < *-nə-hay, -haˀy (Hupa -yəW, -yen). The last three stems may have a common origin.

PA *-ha'ŋ 'eat' (Ø classifier only; with d classifier y or h initial generally disappears, *-da'ŋ): Ing., Koy. -hon, UT -hą', Kut. -d-į' ('overeat'), Hag. -d-ey ('overeat') Car. -d-ay ('overeat'), Nav. -yą́, Tol. -yą, Hupa -yan, At. -ya'n; Eyak x̣-a, Tl. -x̣a. Tlingit -x̣a perhaps reflects fusion of thematic prefix and stem seen in Eyak.

PA *-he'n '(sg.) stands': Koy. -han, Kut. -x̱in (< *-hin), At. -ʒen, UK, Tni. -san, Hag., Car. -yin, Hupa -yen, Kato -yiŋ, Mat. -yi'n, Nav. -zį́, Chip. -yɬ; Eyak -ą''; Tlingit -han. PA minimal pair between 'stand' and *-ye'n 'sharp'.

Finally, we include here two more stems with initial of variable form, for which the correspondences seem downright chaotic, and which perhaps belong under *Ø (=h) initial.

PA *-he'/he'ŋ 'pick berries' (ipf./pf., sometimes invariable): Koy. -ha/han, Ing. -ha, Tni. -ya, UK -ya/yon, Car. -yih/yin, Hag. -yin/yi'n; UT -me', At. -be'/be'n, Hare -bie/mǫ, Tag. -mbe'/ma', Sar. -mo/mi(n), Mat. -be'/be', Hupa -me/me', Kato -be, Nav. -bé/bį'; cf. further Tl. y̱-s-ha 'gather'. Imperfective often with obstruent suffixes -x̱, -ł, perfective variously *-e'('), *-e'n('), also (UK, Hare) *-ha'ŋ (cf. 'win at gambling'). Epenthetic initial y or, most widely, w. Perhaps influenced by Tsimshian ma'y̱ 'berry', at least in some languages; cf. Carrier may 'berry'.

PA *-he˙/ha˙ǫ 'win at gambling': Tni. -naẋ/nun; At. -ne˙/na˙n; Koy. -ya/yo; Chip. -ní/nǫ; Hare -die/no; Gal. -ya/yǫ; Hupa -ye/yan ('devour'); Mat. -ye˙/ya˙n; Nav. -né˙h/nǫ́, alongside -bɬ˙h/bǫ́; Chir. -ndé/ndá, alongside -bɬ˙/bǫ́˙'; Mesc. -bɬ˙/bǫ́˙h. For ablaut e˙/a˙ see 5.1, here perhaps < *-haǫ/ha˙ǫ, hence Northern and Apachean n initials, and/or related to or influenced by *-ne˙/na˙(ǫ) 'pl. die' (e.g. Nav. -né/ná), also widely 'capture; move camp' (perhaps influenced by or transferred from *-na˙ 'move, be alive, safe, save, capture', Eyak all -la), also perhaps related to or influenced by -le˙/la˙ < *-ɬ-hay/ha˙y 'handle pl.'; cf. also *-ya˙ǫ in 'ten', a perfective, and *-he˙ 'pick berries', perhaps also from *-hay, reduced from *-ha˙y, general meaning 'acquire all, handle pl., gather'; Tl. ɣ-s-ha 'gather'. (V. addenda.)

These last two *Ø (=h) initial stems, like the preceding *hVN stems, in a sense resemble most the *yVN stems, especially *-ye˙n 'sharp', which has w as well as y and n initials. However, with 'sharp', epenthetic w appears especially in PCA, and marginally in Apachean, while with 'pick berries' w appears commonly from Alaska to Apachean, and with 'win at gambling' Apachean only has w while PCA has y. Those Northern languages which most consistently keep y in *yVN, Tanaina and Ahtna, now show n in 'win at gambling'. The initial of this stem is at this point therefore particularly difficult to identify, since also no

diagnostic h is yet attested for it. It most closely resembles *-ya'ŋ of 'ten', unfortunately not clearly attested in Alaska, and may in fact belong with that originally, both under *h~Ø~(pf.)y, or under *y (see 2.1.2.2).

2.2.1 Stem-final *ŋ

The problems in establishing *ŋ for PA stem-final position are somewhat different from those for stem-initial. The stem-final contrast between *ŋ and *ɣ or *y is clear (except of course for Hag., Car.), and that between *ŋ and *n is in at least one way clearer or at least better documentable than in stem-initial position, for here now Kutchin, with Han, Upper Tanana, and Tanacross, also make the distinction, literally retaining ỹ for *ŋ (PA here [ỹ]), though in Han, Upper Tanana, and Tanacross the distinction remains only after ə. On the other hand, the stem-final picture in verbs is complicated by the occurrence of a *-ŋ suffixal to open variable verb stems (see 2.2.2) and by the complex analogical patterns or morphological conditioning of developments that take place. For that reason, nouns and verbs with integral stem-final nasal will be treated first, separate from the open variable verb-stems with suffixal nasal.

First of all, however, two additional instances of stem-final *n will be given, with which to contrast those with *ŋ. (Examples of integral stem-final *n are already given in 'land', 'you', 'moss', 'face', 'sing shamanistically', 'sharp', 'mother', and 'sg. stands'.)

PA *c'ən 'bone': Ing. θ̂'ən, Kut., Han, UT θ̂'an, Tna., Tnc. θ̂'ən, Hag. c'ən, Car. ç'ən, Chip. θ̂'ən, Hupa c'ən, Nav. c'ĩn; Eyak c'əl.

PA *wən 'lake': Ing. vən-, Hag., Car. bən, Kut. van , UT man, Tnc. mən, Hupa mən-, etc., see 1.1; Eyak ma' ‹[*wą']; cf. 'mother'.

Examples of stem-final *ŋ now follow. These are fairly common, much more so than for stem-initial *ŋ, and the following list includes only a generous selection.

PA *-cəŋ' 'flesh': Ing. -θ̂əŋ', Hag. -cəy, Car. -cəŋ (see 2.4.2), Kut. -θ̂ą̀ɨ', Han -θ̂ɬ', UT -θ̂ɬ'', Tnc. -θ̂ɨ'', Chip. -θ̂én, Tol. -sən', Hupa -cən' (= -cen'), Nav. -cɬ'; Eyak -ce'; cf. also Tlingit ʌi˘y.

PA *-qɑŋ' 'husband': Ing. -qəŋ', Hag. -qəy, Car. -ki, Kut. -ką̀ɨ', Han, UT -ką̀ỹ', Tnc. -kǫ́ỹ', Hupa -xɑn' (= -xan'), Nav. -ką̀'; Eyak -qa'; Tlingit (Tongass) qa' ('man').

PA *-ɢɑŋ-ə' 'fingernails': Ing. -ɢəŋ', Hag. -ɢi, Car. -gi, Kut. -gą̀ɨ', Han, UT -gą̀ỹ'', Tnc. -gǫ́ỹ'', Chip. -gané, Nav. -gà'n.

PA *təŋ(ə) 'trail': Ing. təŋ', Hag. -təy, Car. -ti, Kut. tąɨ', Han, UT tąỹ', Tnc. tǫỹ', Chip. tənɛ, tɨ-, Tol. -tene, Hup. tən, Nav. tĩ'n; Eyak ta'; Tl. de˘.

PA *-ɢɑŋ 'dry' (adj.): Ing. -ɢəŋ, Hag. -ɢi, Car. -gih, Kut. -gąɨ, Han, UT, -gąỹ, Tnc. -gǫỹ, Chip. -gan, Nav. -gą̀n. Possibly ‹ *-ɢɑm; see 3.2 below.

PA *-ž^{w}əŋ(ə) 'black (thing)': Ing. -ẓəŋ, Kut. -ẓą̨', Han -ẓą̃', UT -zą̃', Tnc. -zę̃', Chip. -zən, Tol. -šən, Hupa -Wən, Nav. -žĩn; Tlingit ša^ xe^-yi 'mountain shadow' and incorporated xi^-, xe^- 'dusk'.

PA *-təŋ' 'handle': Ing. -təŋ', Car. -ti', Kut. -tą̨', Han -tą̃', UT -tɬ'', Tnc. -tɬ'', Chip. -tɬ́ (in dátí 'a short stick used in fishing'), At. -ten'; Eyak -te'.

PA *-təŋ', -ti'ŋ', -ti'n' in 'bow': Ing. gəltəŋ' , Hag. c'əltəy, Car. 'əlti' (older Car. -təŋ', see 2.4.2), Kut. k'ilt̨ą̨', Han č'i̯htą̃', UT c'ihtą̃', Tnc. c'ehtɬ'', At. c'ilten', Tni. c'iltən, Tna. θ̂'iltən', Chip. 'i̯ltín, Gal. c'altɬ', Hupa c'əltən' (Curtis), Nav. 'áltɬ́'' (Nav. tone irregular, Sapir, Hoijer, Young; but Haile has -tĩn, -tɬ''). First syllable unstable initial variously *c'-, *č'-, *k'-; vowel i', e', ə; see 5.3.

PA *da'-ʒəŋə 'loon': Ing. doʒəŋ', Car. daʒi, Hag. deʒi, Kut. de'ʒą̨', UT ta'ʒɬ'ł, Tnc. ta'ʒi'ł, At. daʒeni, Tni. duʒəni (Kenai dialect duʒəmi, see 3.2), Chil. danʒən.

PA *ła'ŋ, neuter perf. *-la'ŋ 'many': Ing. loŋ, Hag., Car. ła̯y (older [ła̯ỹ], see 2.4.2), Kut. -lę́ɬ', Han lą', UT -lą', Hupa -łan, Chip. łą, Nav. -łą́, At. -la'n.

PA *-ləŋ 'flow': Ing. -ləŋ, Hag., Car. -li (older Car. -ləŋ, see 2.4.2), Kut. -lą́ɬ, Han, UT -lą̃ỹ, Hupa -lən, Chip. -lɬ, Nav. -lɬ́, At. -len; Tlingit -ła 'tide goes out, melt'.

PA *-čəŋ' 'stingy, bad': Ing. -cəŋ', Car. -ci', Hag. -cəy', Kut. -cą̨ɬ', Han -cɬ', UT -cɬ'', Chip. -cán, Hupa

-č^{w}ən' (=-č^{w}en'), Gal. -san', Mat. -tcxiŋ', Nav. -čɬ'; perhaps also Eyak -ša' 'stingy', -šiyah 'bad'. Cf. Tlingit -ʒiɣ 'balk' and -ʒi' 'be difficult'.

PA *-ta'ŋ-ə' 'integument, bark, membrane': Ing. -toŋ', Hag., Car. -tay, as in Hag. k'eltay, Car. k'altay 'willow bark', 'əla'tay 'cambium', UT -tà'n, Chip. -tané 'the inner side (of skins, clothing etc.)', Koy. -ton; perhaps also Kut. -tɬ' 'back fat'; Eyak -tah, -tį'- 'skin'; Tl. -da^-yi 'outer bark'. See also *-ta'ŋ 'thick' below.

PA *-de'ŋ 'emit light': Han -dąɣ', Car. -di, Chip., Hare, Dgr. -dį, At. -de'n, Tni. -dan, Sar. -dí(n-), Mat. -din, Hupa -den, Nav. -dí'n; Eyak -de.

PA *-dəŋ 'know (how), be accustomed to': Ing. -dəŋ, Kut. -dąį', UT -dąɣ', Chip. -dən, Hupa -dən ('be content with'), Sar. -dĩn, Nav. -dĩn; Eyak -de' 'understand'; Tl. o-x̣ -da 'be used to'.

PA *-təŋ 'surfeited, tired (of food)': Car. -ti, Kut. -tąį', Han, UT -tąɣ, Chip. -tenn (Legoff, 'se rassasier'); Eyak l-də-te.

PA *łəŋ(-k'V) 'dog': Ing. łeg, Car. łi (older łəŋ, see 2.4.2), Hag. łəy, Kut. łąį', Han łąɣ', UT łį', Tnc. łi', Chip. łɬ, K-T łi'n, łi'l (see 2.4.4), Tol., Gal. łį', Hupa łən' (=łen'), Nav. łį'' 'horse'. Correspondences complicated by suffix, especially in possessed forms.

PA *da'ŋ'(ə), dəŋ'(ə) 'spring (season)': Ing. dəŋ', Car. day ('famine'), also danɣ^{w}ən 'midsummer' (see 2.4.2), Kut. dɮį',

Han dą̃ỹ', UT -dąį', Chip. dá ('famine'), Tol. dą', Mat. daŋ' 'summer', Hupa dan', Nav. dą̃'.

PA *-ci'-ɣa'ŋ' 'brain': Kut. -kĩ'ɣą̃į', Car. -cinɣay (see 2.4.2), Han -ôĩɣą̃'', UT -ôĩ'ɣą̃'', Tnc. -ôíɣą́'', Koy. -ʌiɣon', At. -ciɣa'n', Tni. -ciɣun, Chip. -ôíɣą́ (-dshiᵨᵨan, Legoff), Gal. -są', Nav. -cĩ'ɣą̃''.

PA *łe'ŋ, (də)-le'ŋ-ə 'green wood': Ing. -laŋ', perhaps Eyak łį'y (barely remembered, "some kind of (tough?) wood"); cf. *ŋə-le'-ŋ-ə 'meat' (< 'essence'), e.g. Chip. deʌinį 'green wood', dɛlįnį 'meat kept in good condition'; cf. also -le'-ŋ 'be' below, old nominalization with suffix here treated as integral to stem.

The following are irregular in showing disagreement between Ingalik, Kutchin, Han, Hagwilgate, and/or Carrier, in that some reflect *ŋ while others reflect *n.

PA *-le'ŋ-ə'/-le'n-ə' 'castor': Ing. -laŋ'; but Kut. -lĩn, Hag. -lin, Han -lẽn'; Nav. čã'lį'd.

PA *-ʌəŋ/-ʌən 'steep': Ing. -ʌəŋ, UT -ʌą̃ỹ; but Car. -ʌen, Kut., Han -ʌan'; Chip. -dlenn (Legoff, 'en pente').

PA *-ta'ŋ/-ta'n 'thick': Hag., Car. -tay, Kut. -tį'; but Ing. -ton; Chip. -tą, Tol., Gal. -tą', Hup. -tan, Nav. -tą́; perhaps *-ta'-ŋ with perfective suffix, and/or related to 'integument' above.

To this list should be added e.g. *-ɣa'ŋ 'wise', *-ya'ŋ in 'ten' (shown in 2.1.2.2), *-ha'ŋ 'win at gambling' (2.1.2.3),

and *-ha'ɳ 'eat' (2.1.2.3), some of which show various complexities, in part due to ablaut (see 5.) and confusion with other stems. Another stem *-na'ɳ$_2$ 'drink' (2.1.2.1) is similar to 'eat' with final -n in Ingalik, like the others, but has irregularities in the vowel, treated in 3.2.

Note that in stems of the form *Təɳ' (where T is an apical), i.e. in the three examples *-čəɳ' 'stingy', *-cəɳ' 'flesh', and *-təɳ', *-ti'ɳ', *-ti'n' 'handle, bow', there are apparent irregularities in that Han, UT, and Tanacross usually show -Tɬ', -Tɬ'', and -Tɻ'' respectively, but Han has -tą̆ỹ' for 'handle' and 'bow', and UT has both, -tą̆ỹ' for 'bow' and -tɻ'' for 'handle'. Note also that Chipewyan has -tɻ́ (not *-tə́n) for 'handle' and -tín for 'bow', suggesting perhaps PA *-ti'ɳ' or *-ti'n', generally reduced, and/or partially confused with an originally different *-təɳ' 'handle'. Cf. also 'dog', and above all, discussion in 5.3, end. The doublet in older Carrier, is presumably of different origin (2.4.2).

2.2.2 Suffixal *ɳ

Certain open verb-stems take a nasal suffix in active perfectives and neuter imperfectives.[7] From the evidence of Kutchin and Hagwilgate-Carrier this suffix should be reconstructed *-ɳ,

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7. Except where the perfective stem was modified by glottal stop, or where the PPA stem ended with a sonorant lost in PA (see 5.1). What now serve paradigmatically as neuter imperfectives in modern Athabaskan have a morphology (prefix and suffix) closely related to the perfective (see below, 2.3.7).

but in Ingalik the suffix is -n instead of -Ǫ. Note also that the final of *-na'Ǫ$_2$ 'drink' (2.1.2.1) is here evidently treated as suffixal, -n in Ingalik (see 3.), as is the final *-Ǫ of perhaps all verb stems with full vowel. In Eyak there is a general perfective suffix -ł; cf. the Athabaskan progressive and negative perfective suffix *-ł; corresponding to PA stem-final and suffixal *-Ǫ Eyak quite regularly shows Ø (7.3.2). We shall take but a very few examples of many such open stems.

PA *-'a'-Ǫ 'round object classificatory stem' (perf.): Ing. -'on, Kut. -'ą̇', Han -'ą̨', UT, Tnc. -'ą', Hag., Car. -'ay, Chip. -'ą, Hupa -'an, Nav. -'ą́; Eyak -'ah-ł (with general perfective suffix).

PA *-le'-Ǫ 'be' (neuter imperf.): Ing. -lan, Kut., Han, UT -lį̇', Hag., Car. -li, Hupa -len, Nav. -lį́; Eyak -łeh (neuter imperfective).

PA *-žu'-Ǫ 'be good' (neuter imperf.): Ing. -ẓen, Kut. -zį́' (< *-zį̨ǫ̨į̨ < *-zǫ̨į̨), Car. -zu (older -zǫ, see 2.4.2), Han, UT -zǫ', Tnc. -zǫ', Chip. -zǫ, Tol. -šəm, Hupa -Won, Nav. -žǫ́; Eyak -ʒu' (adjectival).

Some other open stems very common in Athabaskan which take the perfective *-Ǫ suffix are PA *-te'(-Ǫ) 'sg. animate lies' (Eyak -te), *-qa'(-Ǫ) 'handle object in container' (Eyak -qa), *-qe'(-Ǫ) 'go by boat' (Eyak -qe), *-we'(-Ǫ) 'swim' (Eyak -we), *-ɣe'(-Ǫ) 'carry on back' (Eyak -x̣e), *-ƛ'u'(-Ǫ) 'bind' (Eyak -ƛ'i), *-ɣe'(-Ǫ) 'kill singular object'. Some open verb stems

which do not take the nasal suffix in the perfective are *-ya· 'singular goes', *-da· 'singular sits', *-la· 'handle plural objects', *-t'e· 'be a certain way', *-'a· 'extend' (-a, -da, -ɬ-a, -t'e´, -'a´ in Eyak); the reason for this will be explained in 5.1 below.

(See also Addenda for another such suffix.)

2.3 Prefixal *ǫ

As mentioned above (1.), *ǫ has been reconstructed for two of the conjunct paradigmatic prefixes in PA. In fact, despite the morphophonemic complexity associated with these prefixes, the phoneme was first spotted (both by Sapir and in its later "rediscovery") in these prefixes, the perfective marker and the second person singular subject pronoun. These two prefixes will be treated in some detail here.

The reason that *ǫ was first identified in this prefixal position in spite of the difficulties, is no doubt because of the very widespread and obvious n~ɨ (or n~i) type alternations throughout the modern Athabaskan languages. In these prefixes it must be recognized even synchronically in a great many languages (depending on one's phonological theory) as an underlying phoneme or morphophoneme.

For instance, in Hare, where in stems the reflexes of *ǫ are indistinguishable from those of *n, Scollon noted (p.c., 9/17/1978) that ne- 2s sj., ne- adjectival, and nié- 'across' remain n- whereas in other prefixes n › r. Rice, also

responding to the earlier version of the present paper, in 1979 on "The Status of *ỹ in Northeastern Athapaskan" observes that prefixal *n is normally realized in Slavey as nd, Hare r, and Dogrib d, but that *ǫ̲ behaves quite differently, remaining n in absolute initial, otherwise causing e > į. She demonstrates this especially for 2s sj. #ne-~-į-, also noting #ne- 'adjectival' and (her fn. 6) -į- perfective. For these she posits /ñ/ (as opposed to /n/) as an abstract segment, a synchronic phonological entity useful in the description of the Mackenzie languages. It seems likely to us that the Mackenzie languages are far from exceptional, but are rather typical of Athabaskan in this respect.

The perfective marker proper, an n~i type prefix in modern Athabaskan which is manifested at least (originally) to the right of the subject pronouns, if manifested at all, is not to be confused with what have been called the "perfective prefixes," *s(ə)-, *ɢə- > ɣ̨ə-, and *nə-, which are more properly called conjugation prefixes. These three prefixes are in fact each found in both perfectives and non-perfectives, and thus do not in themselves distinguish the perfective.

A note on the use of the term "perfective" is in order here. We attribute the n~i type perfective prefix, and also the perfective suffix *-ǫ̲, not only to active perfectives but also to neuter imperfectives. A "stative" such as *sə-te'-ǫ̲ 'he is lying (prone)' is in form a perfective, like the corresponding Eyak sə-teh-ł 'he lay down, he is lying', though synchronically it must be termed a neuter <u>imperfective</u>, at

least in languages which have full modal inflection for neuters (having also e.g. neuter perfective *ɣə-ŋ-te' 'he was lying (prone)'). Likewise, a *nə-adjectival" neuter such as *ŋə-le'-ŋ 'he is' is in form clearly a perfective, but is termed a neuter imperfective in view of the neuter perfective *ɣə-ŋ-le' 'he was'. (Cf. Indo-European, especially Germanic "preterite presents," e.g. German ich weiss, historically a preterite, now functioning as a present, alongside the later preterite formation ich wüsste.)

The perfective marker itself as now reconstructed was in its fullest PAE shape **ŋi- with the PAE allomorph **-i- (PA *-(ə)-) in specific environments. Its shape for PAE can be generalized **(ŋ)i-, for PA *(ŋ)(ə)-.

As demonstrated in Krauss 1969.58-62, with the vocalic classifiers də- and łə- the perfective marker was manifest as "an umlauting (ə > i) of the vocalic classifiers" in PAE (1969.59), still an overt synchronic process in Eyak, də-~di-, łə-~łi-, but only vestigial in Athabaskan, mainly in the y-initial of the stem *-ha'w 'singular goes', where in tne perfectives **-di-ha'w > PAE **-diya'w > PA *-dəya' > -dəya, often further > -dya, -ǯa (as opposed to *-də-ha > -da everywhere). It is interesting that this epenthetic stem-initial is never -n- in Athabaskan, proving that the perfective marker manifest to the right of the vocalic classifier retained no feature of nasality (as opposed e.g. to 2s in tə-ŋ(ə)-(h)a'-x 'you go forth', variously modern reflexes such as təna'x, təya'x, tənya'x, ti'ya'x).

Where the PAE perfective marker was immediately preceded by a consonantal prefix, it had the allomorph **-i-. Such consonantal prefixes were the first person singular subject pronoun **x(^{w})- (or **š-?, see Krauss 1976) and the second person plural subject pronoun **(nə)x̣^{w}- (PPA *x̣^{w}-).[8]

Thus the perfective marker occurred as -i- in the PPA sequences *di-, *łi-, *x(^{w})-i-, *x̣^{w}-i and possibly also in *s-i-. Two processes then operated on these sequences in the transition to PA. First, the contrast between PPA *i and *ə was neutralized, so that *di-, *łi- were no longer distinct from *də-, *łə-. Second, intervocalic fricatives were voiced. This voicing was at first non-phonemic, but in PA voiced fricatives had probably achieved marginal phonemic status. This allowed the following *ə to be elided without loss of information. Thus, following a vocalic prefix the distinction between *łə- > *lə- > *l- and *ł- > *ł- was maintained by voicing. Likewise, *sə- > *zə- > *z- following a vocalic prefix.

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8. The s(ə)- conjugation marker is also a possible candidate for inclusion here as a consonantal prefix. Immediately preceding non-zero classifiers, this prefix had the allomorph *s- in PA, as for example in *na'tɛ̀'sdəya' 'he started off again' and *yətɛ̀'słte'ŋ 'he started carrying him' (but cf. Eyak səłtehł 'he carried him'). It may then be the case that with Ø-classifier and Ø subject prefix the perfective marker had the shape -i- after the s- allomorph of this prefix, as in *tɛ̀'z(ə)ya' < PPA *te'siya'w (?) 'he started off'. However, the **(ŋ)i- prefix is clearly absent in Eyak s-ahł 'he went', as well as before the ł-classifier in PA *yətɛ̀'słte'ŋ. Stem-initial *y in *tɛ̀'z(ə)ya' may thus be due to analogy with the rest of the perfective paradigm. The reconstruction of the s-perfective is quite problematic in other respects as well; note for example the glottalization in PPA *Cə-'-s- > *Ce's- > PA *Cɛ̀'s- (*Cɛ̀'z-).

In the first person singular of perfectives with non-vocalic classifier, PAE **Cə-š-i- (or **Cə-x̲-i- ?) › PA *Cəyə- › *Cəy-, which in much Athabaskan › *Ci˙ (5.3): e.g. Kutchin Ci˙-, Chipewyan Ci(·)-, Navajo Cí- or Cé- (here the high tone is the reflex of a full vowel[9]), Hupa Ce-, Chilcotin Ci-. Many other Athabaskan languages have analogically extended the voiceless form of the subject pronoun from the perfective prefixes with vocalic classifier and the non-perfective prefixes also to the perfective with non-vocalic classifier, e.g. Koy., Tna., Car. Cəs-.

Similarly, in the second person plural perfectives with non-vocalic classifier, PAE **Cə-x̲^{w}-i- › **Cəx̲^{w}ə- (=Cux̲ə-) › *Cux̲ə- › *Cux̲-, which in much Athabaskan › *Cu˙-: e.g. Kutchin Co˙-, Nav. Co˙-, Hupa Co-. Again, some languages have analogically restored the voiceless form of the pronoun: Koy., Tna. Cvx̲-, Car. Cəh-, Chip. Cuh-.

In the third person perfectives (except the s-perfective) with non-vocalic classifier (and also in second person imperfectives), PAE **Cə-n̲i- › PA *Cə-n̲ə- › *Cən̲-, which in most

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9. Keeping in mind that prefix vowels in PAE were of three possible types,

PAE	PA	Chip.	Nav.
**CV	*CV	CV̨	CV̨
**CV˙	*CV˙	CV̨	CV̨, CV̨˙
**CV̀	*CV̨˙	CV̨	CV̨˙

we see that CV̨ in Nav. is a normal reflex of a non-constricted long vowel. Furthermore, the phenomenon known as n-absorption in Nav. and Sar. can be simply explained as the reflex of a long nasalized vowel: *Cə-n̲ə- › *Cən̲- › *Ci˙- › Cí.

Athabaskan > Cɬ'-, with the subsequent loss of nasalization in many languages: Ing. Ce-, Koy. Ci-, Canadian Kut. Cɬ'-, Alaskan Kut. Ci('')n-, Hag. Cin-, Car. Ci-, Chip. Cɬ-, Nav. Cí- (where, again, high tone is the reflex of a long vowel). Hupa Cən- (Kari 1975.345) and perhaps Alaskan Kut. Ci('')n- reflect the earlier *Cəɳ-, and not *Cɬ'-.

The perfective marker appears in its fullest PA form *ɳə- in absolute initial position in third person (the absence of subject pronoun), the old neuter zero-perfective. As mentioned above, this is the form that so widely appears as "nə- neuter adjectival," as in the reflexes of *ɳə-le'-ɳ 'he is', *ɳə-žu'-ɳ 'he is nice', *ɳə-dǻ'z 'he is heavy'. As can be seen from the overt presence also of the *-ɳ perfective suffix in the first two (and its covert presence in the third), this is originally a perfective form, with zero perfective conjugation prefix, now generally serving as a neuter imperfective. Like the perfective prefix combined with conjugation prefixes, this prefix without such conjugation prefixes is deleted (absorbed) with də- and lə- classifiers (but in Eyak də-, łə-, di-, łi-), e.g. Koyukon nəlan 'he is', no-dəlan 'he is again' (Eyak yiłeh, q'e' diłeh).

The perfective marker was also deleted in PA with first sg. and second pl. subject pronouns (thus *hə-š-łe'-ɳ 'I am', *hə-x̣^{w}-łe'-ɳ 'you pl. are', with "peg" prefix *hə-), Koy. 'əslan, 'ɑx̣lan, though not in Eyak x-i-łeh, ləx̣-i-łeh. In the third person, however, the absolute initial perfective

marker in these verbs is manifest in full form as *ŋə-, here directly distinct from the reflexes of *nə- only in Ingalik: Ing. ŋə-, Kut. nə-, Hag. nə-, Car. n-, Chip. nə-, Hupa nə-, Nav. nĪ-, but morphophonemically distinct very widely (e.g. Rice 1979 /ñ/). Eyak has (-i-~)yi-, perhaps from Øi-. The Tlingit cognate is the ya- "classifier" (see 7.5, 8., Krauss 1969.66-72).

Perfective marker in absolute initial position:

PA *ŋə-žu'-ŋ 'he is nice': Ing. ŋəẓen, Kut. niziɬ', Han, UT nzǫ', Tnc. nzų', Car. nzu, Chip. nɛzų, Hupa nəWon, Nav. nĪžǫ́.

PA *ŋə-le'-ŋ 'he is': Ing. ŋəlan, Kut. niliɬ', Han nliɬ', UT nliɬ', Hag. nəli, Car. nli, Hupa nəlen, Nav. nĪlɨ́; Eyak yiłeh.

PA *ŋə-då'z 'he is heavy': Ing. ŋədoθ, Kut. nidĪ', Han ndã', UT ndò·^{h}, Hag. nədez, Car. ndaz, Chip. nɛdáð, Hupa nədas, Nav. nĪdã'z; Eyak yiłda's, Tlingit ya-dał.

The *ŋə- (> nə-) perfective marker was analogically restored in many Athabaskan languages (e.g. Chip., Nav.) with the first person singular and second person plural subject pronouns in the neuter (adjectival), e.g. Nav. nĪšłɨ́ 'I am' (cf. more historical Tna. 'əslan), where it now resembles a thematic prefix.

It is probable that this same *ŋə- prefix occurred in some form with the optative, where it is again identified as

the "y-component" by Krauss (1969.69-70). But here there are complexities which will require further investigation before the exact forms of the paradigm can be reconstructed for PA(E).

The PA second person singular (subject, object, and possessive) pronoun also began with *ŋ-. The Eyak subject form (y)i- and object and possessive form 'i- point to a PAE **ŋi- which gave rise to PA *ŋə-. The modern Athabaskan second person singular object and possessive form, and subject form in absolute initial position, is found as follows.

PA *ŋə- second person singular subject pronoun, absolute initial:
Ing. ŋə-, Kut. nə-, Han n-, Hag. nə-, Car. n(y)-, Chip. nɛ-, Hupa nə-, Nav. ni-; Eyak (y)i-; Tlingit (')i-.
(Compare also 'you', the independent pronoun, 2.1.)

The second person singular subject pronoun in the verb is thus homophonous with the perfective prefix, and is subject to the same morphophonemic alternations, giving rise to identical modern forms except where affected by analogy.[10]

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10. There are no other verbal prefixes in which PA *ŋ has so far been definitely identified (except, of course, for 2s. object and object of postposition). The conjunct thematic adverbial and gender *nə- and the *nə- conjugation marker both contrast with the 2s. subject and perfective marker. It is true, however, that the *nə- conjugation marker unaccountably becomes 'i'- in conjunct-initial position before də- and l- classifiers in much Athabaskan, e.g. Koyukon, Ahtna, Tanaina, Kutchin 'i'-, Navajo 'í-, e.g. *na''i'dəya' 'he arrived back'. No disjunct verbal prefixes with *ŋ- are yet identified, even where such might be expected; as with 'across', the form is *na'n'-, *nd'- (see *ŋa'n' 'across', 2.1.1). (V. also addenda.)

The second person singular forms in the perfective with non-vocalic classifier are also easily explained by the syncope of ə: PAE **Cə-ɢi-ɢi- > *Cə-ɢə-ɢə- > *CəɢɢəC- which in most Athabaskan > *Cɬ'ɢ(ə)-: Ing. Ceŋə- (but ɣaŋə-), Koy., Kut. Cin-, Chip. Cɬ-, Nav. Cíní (< *Cɬ'ɢə-, where the high tone on Cí is again the reflex of a long vowel, and the tone of -ní- is raised by assimilation), Hupa Cən. Here again, the second person s-perfective appears to lack the *ɢə- perfective prefix in some languages: Ing. ðe-, Koy. li- < *zɬ'- < *sə-ɢ(ə)-.

In the neuter (zero) perfective, where there was no conjunct prefix preceding the second person singular subject pronoun, the PAE **ɢi-ɢi- shows the expected development, PA *ɢəɢə- > *ɢəɢ-, > *ɢɬ'-, in Chip. nɬ-, Nav. ní-, but in other languages we see forms analogical to the other perfective forms, Ing. 'əŋə-, Koy., Kut., Hag., Car. 'in-.

Where preceded by disjunct prefixes, or prefixes of the form *CV'-, the 2s sj. and perfective markers predictably remain more as they do in initial position, e.g. Ing. dəŋət'an 'you are (thus)', 'eŋəqad 'you buy it' (here Ing. e < PA *u').

In Eyak the (y)i- of the second person singular subject pronoun is deleted with (a) all vocalic classifiers (łəčąh 'you stink; he stinks'), (b) all s-perfectives (səɬdahł 'you sat; he sat'), and (c) with yi-neuter. The result of yi-yi- is also yi- (yiłeh 'you are; he is'), where it could however be said that either the neuter or the pronominal prefix is deleted. The sequence PAE **Cə-ɢi- in Eyak > Cə-(y)i > Ci'-, in both neuters and second persons. For details see Krauss 1965.

2.4.1 Holikachuk

Holikachuk is the language formerly of the Innoko River; the last village, Holikachuk, was moved to Grayling on the Yukon in 1967. Previously considered a dialect of Koyukon, but intermediate between Koyukon and Ingalik, it was defined as a separate language in 1974. The development of *ŋ in Holikachuk is unsurprisingly also partly like that in Ingalik. The language is less abundantly documented than Koyukon and Ingalik. The following data are from Kari's noun dictionary (1978). Stem-initial *ŋ- is regularly n-, as in -naθ 'long', nən' 'earth' . Stem-final *-ŋ is usually also -n, as in łon 'many', -qən' 'husband', daʒən' 'loon', -θ̂ən' 'flesh', łan 'green wood', but in a few cases it is ŋ: təŋ' 'trail', -təŋ' 'bow, handle', dəʌaŋ' 'spruce'; in at least one stem it is both: -zəŋ', -zən' 'black'. There may be much more variation than indicated in the source; such variation is easily understood in view of the intermediate position of Holikachuk. In disyllabic stems, however, Holikachuk is most like Ingalik in showing medial -ŋ- rather consistently. Examples will be given in section 6.2.

2.4.2 Recent history of stem-final *-ŋ in Carrier

The first documentary evidence for PA *ŋ was in Mackenzie's 25-item Carrier ("Nagailer") wordlist from June 1793 (Mackenzie 1801:257-258), including two relevant items, 'Dog' Sleing and 'Bow' Nettuny, clearly indicating palatal nasals of some sort

in both cases. (The latter bears some qualification, however, as it might easily be misprinted e.g. from a hypothetical ms. Neltung.[11] The initial N- may indicate only nasalization.)

We are fortunate to have a much larger Carrier vocabulary, 306 entries, from Harmon, from about 20 years later (Harmon 1820:353-362), including at least nine different stems with final *ŋ. The phonetics implied in six of these are more or less as in Carrier today ('Nails' E-lâ-ki [-g^{ə}i], 'Husband' E-ki [-k^{ə}i], 'Path or road' Tee [ti], 'Door' Tâ-tee, 'Loon' Tâd-joy [-ʒəy] (?), 'Handsome' Ne-zo [-zu], 'To drink' Ate-ni [-nay]); in two, however, the final sonorant is definitely a nasal of some kind, as in Mackenzie: 'Dog' Cling, and 'Much' Clyne (also 'Too much' Stân-clyne); in one Harmon shows a doublet: 'Bow' Al-tung and 'Gun' Al-tee (also 'Gun case' Al-tee-zus).

Documentation essentially still for this period is provided by Morice, writing in 1890 (Morice 1891:210): "I shall lay before the reader lists of words that have undergone any variation during the present century...

Old words (100 years ago)	New words
łœɴn, dog	łi
œłthœɴn, bow	œłthi'

11. Unfortunately, the ms. of Mackenzie's 1793 voyage has disappeared (Lamb 1940.47).

chæntsæNn, pine	chæntsi
ninlæNn, it flows	ninli
tæṭaNn, duck	tæṭai
talṭaNn, torch	talṭai
nzoNn, (he is) good	nzu ...

[fn.] I base my computation of time upon the age of my informants. One of them, who died two years ago [1888], was close to 100 years old, since he had a clear recollection of the advent in this country of the first white men in 1793." On the phonetics of N, Morice mentions only that "N is nasal" (1891:172), but note taNnge 'four', where Nn apparently represents [ŋ](< n/__g).

Morice, in his monumental Carrier grammar (1932:503) repeats this list, with additions. "We have ourselves heard instances of the old way of speaking on the lips of a few old Carriers. Formerly our -ai, -u endings were -ăn, -ŏn respectively; present -i, -i' [-i'] or ĩ were -eñ..., as will appear in the following: Old Way teṭăn 'ducks' (Today teṭai), nĩzṭăn 'ripe' (nĩzṭai), tethăn 'thick' (tethai), talṭăn 'torch' (talṭai), nzŏn 'good' (nzu), łeñ 'dog' (łi), nĩnleñ 'current' (nĩnli), tcentseñ 'Douglas fir' (tcentsi), eltheñ 'bow', 'gun' (elthi'), ntseñ 'bad' (ntsi'), tenê-theñ 'old man' (tenê-thĩ)." [12] On the phonetics, Morice explains

12. Of the forms in this list not already treated above (2.2.1), 'torch' is clearly a passive of O-d-ł-t'a' 'handle O (fire)', a well attested theme, with perfective suffix. For dəne-təŋ 'old man', cf. Hag. dənitəy and Chil. dəniti (Morice), Sek. dəne'či' (Young), UT č'atay, all of which clearly indicate *-y or *-ɣ rather than *-ŋ; for 'Douglas fir' cf. Chil. cincén (< PA *-č(ʷ)əŋ' or *-č(W)ən'). For dət'aŋ 'duck' cf. Chip. dət'âi 'birds' (< "feathered ones"); for nizt'aŋ 'ripe' cf. Mattole ne'et'á'n 'it becomes ripe', Nav. nit'á (neuter perfective stem).

(1932.4) that "ă and ŏ. . . represent respectively the nasal sounds of French tan, ton, to which, as they are invariably followed by common n or m, is added the sonant value of these letters." On the other hand, "ñ. . . is a sort of semi-nasalized n, which recalls the -ng of English 'slang, sing, song'. Found in añ 'cavern'; etseñ 'meat'; împîñ 'love', 'turtle'; khassuñ 'mountain maple'. Its use is not very frequent." Later (1932.15), in describing distributions, Morice says that "ñ always ends, never begins, a syllable. About the only cases when it is terminal with regard to the whole word are pañ 'edge around'; etseñ 'meat'; împîñ 'pigeon'; stem'oñ (probably a loan word) 'hump-back salmon'; tetseñ 'grassy'; khassuñ 'mountain maple'; hwotsotseñ 'spider'; thĕssatêñ 'bone fishing-pin (of the ancients)'." [13]

Taking Morice's phonetics at face value, it would appear from his 1891 account that these stems take the form VNn [Vn] in all cases, except that his transcription of 'four' tæNnge for [dəŋge] or [dəŋye] perhaps implies something different, at least after ə. In his 1932 account, Morice implies just such a difference, ăn and ŏn, but eñ [əŋ], that is [V] (or

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13. Except for 'meat' and 'spider', Morice's final ŋ in these cases is not corroborated by either contemporary Carrier (cC, from Walker 1974) or the correspondences: 'cavern' cC 'an, Hag. 'an, Ing. 'on, Kut. 'an', Han 'an'; 'edge' cC -ban, Ing. von', Kut. van', Han măn'; 'dwarf maple' cC xasʒun; for 'grassy' cf. perhaps Ing. -can' 'grass'; for 'bone fish pin' < ?, v. Morice 1894.72 thé-sateñ, described, and cf. perhaps Chil. dadən 'fish spear'; for 'dove' cf. Hare, Slavey inminé (Petitot), perhaps onomatopoetic; 'humpback salmon', Hag. sdemon, Chil. c'əman, is obviously a diffusion, cf. Tsimshian sdəm'o'n.

perhaps [ɣŋ]?, cf. Chilcotin, 2.4.3) with full vowels, but [əŋ] with ə, for native Carrier words. For a valuable and detailed discussion of the problems in interpreting Morice's phonetics, of the development of *ŋ in Carrier prefixes as well as stems, and of the sonorant system in Carrier generally, partly in response to the earlier version of this paper, see Story 1978, especially pp. 20-22, 27-33.

It is not clear at what point *ŋ in Carrier had split phonetically in two distinct directions, y and/or a nasal, and the nasal variants were gradually abandoned in favor of the y, and how long there remained a range of allophony (as perhaps implied e.g. by Sleing, Nettuny, Cling, Clyne, as well as Al-tung or Al-tee), partly conditioned, partly free, which may have split distinctively only in the last century, with almost all items falling on the side of y. However, probably by the time Morice and/or his informants were moved to note the variation explicitly, the reflexes of stem-final Carrier *ŋ had definitely bifurcated into what were felt as two phonemes. It is probably significant and interesting that in Harmon's doublet, the "modern" (ascendant) form -ti' is used for 'gun', while the "old-fashioned" nasal is used in 'bow'.

For contemporary Carrier, beside Story (1978), the most explicit account we have of this aspect of the phonology is from Cook, who also confirms (1976:28) that there are only two forms left with ŋ (independently, not from n before a velar), ['əcəŋ] 'meat' and [x^{w}əcocəŋ] 'spider' (perhaps a derivative with the same stem as in the former), in the Trembleur Lake

and Fort St. James dialects. Cook further notes, however, that in the Stewart Lake dialect these are now [ʾəcəŋk] and [x^{w}əcocəŋk], reinterpreted with non-canonic final cluster /ng/, thus eliminating /ŋ/ as such altogether. Note, however, the modern doublet in *daʾŋ' 'spring' > day 'famine', but danγ^{w}ən 'midsummer', and -cinγay 'brain', where [ŋ] has persisted before γ, in the first case directly from *ŋ, and in the second displaced, as anticipation of nasalization in following syllable, later lost there, [*-ciʾγ̣aʾỹ' > *-cį̇ʾγ̣aʾỹ' > -cį̇ʾγaʾy].

2.4.3 Chilcotin

There are probably traces of a distinction for stem-final *ŋ in Chilcotin. In stem-initial and medial position *ŋ is regularly (voiced) n (= n < *n), as in nənáẑ 'long', -nad 'fin', (< 'fish meat'), nán 'land', χənáŝ 'raft', tənəł 'birchbark basket', ĉinł 'axe' [$c^{ə}$įł]. Stem-finally from PA *-ŋ', -ŋə, -ŋəʾ (in which -ʾ is now manifest only as high tone and -ə(ʾ) is totally deleted), *ŋ is also regularly n (=n < *n), as in bəǩán 'her husband', nəncán 'you are bad', ʾəĉán 'meat', ʾətən 'trail'. However, in absolute final (i.e., PA absolute final) position there may well be vestiges of a contrast between PA *ŋ and *n in Chilcotin in a contrast that still persists (v. Krauss 1975) between voiced -n# (< *-n#) and voiceless -n̥# (< *-ŋ#). The two are largely in morphologically determined complementary distribution, it seems, in that verbs usually have voiceless final -n̥ and nouns voiced -n, thus e.g. tən 'ice' but χaŝtən̥ 'it is frozen'. That the final in verbs

should be generalized to ŋ especially in perfectives is easily understood, e.g. *-tən-ŋ for the preceding may even be posited for some historical stage of PA, or PPA, along with nəzuŋ 'good' (< *ŋə-žu'-ŋ), nanəsʌ'uŋ 'fence' (< *-ʌ'u'-ŋ 'woven'), etc.; but voiceless final -ŋ is apparently generalized also to imperfectives with PA final *-n as in nəɬcəŋ 'he stinks', həǯəŋ 'he is singing'. In nouns, on the other hand, since absolute final *-ŋ# is quite rare, while *-n#, or *-n- or *-ŋ- followed by ' or ə(') are much more common, it is accordingly expected that Chilcotin nouns would ordinarily end with voiced -n. The most notable exception so far documented is łiŋ 'dog', contrasting with the final of e.g. səban 'my mother' (< *-ha'n), and this particular exception of course serves to reinforce the hypothesis. 'Many' is also łaŋ, and its morphological status is probably also nominal.

Krauss in 1975 had literally only the last few minutes of his brief Chilcotin fieldwork to investigate ŋ vs. n, and that was before we were clearly aware of the PA *ŋ/n distinction. Chilcotin final -ŋ# and -n# obviously need further investigation in this light. Chilcotin may moreover not be the only modern Athabaskan language with phonemic contrasts in the stem reflecting PA *ŋ/n that have hitherto escaped notice.

2.4.4 Kwalhioqua-Tlatskanai

There are also traces of reflexes of *ŋ as distinct from *n in Kwalhioqua-Tlatskanai stems. Here, however,

we are very unlikely ever to have new data, but are forced to rely on old wordlists and the art of philology (see Boas and Goddard 1924b; also Krauss 1973.917-918, 1979.869-870, for discussions of the source material, which Krauss has more fully compiled and collated).

It appears from this material that *ǫ develops ordinarily as *n, e.g. in the transcriptions implying [n][14] stem-initially in 'land' [ne'^{n}], 'body' [-nəst'e'], 'thou' [nə(n)k]; stem-finally in 'husband' [-kɑ'^{n}], 'brain' -tsɛ́xa'n (Teit), 'flesh' [-cən'], 'black' [-zəne], 'trail' [təne], 'spring' [da'ne], 'bow' [c'əɬte'^{n}], 'bad' [nəcəne, nəcən'], 'good' [nəzun(e)]; the latter two forms also show *ǫ in prefixal and suffixal position, as does 'hungry' tī́.tse (Teit) (< *də-ǫ-či'-ǫ), though differently. Second person prefixes are also n(ə)-, as in na'n 'thy mother'; however, note also [tənas, təya's] '(you) go', [nəna's, nəya's] '(you) come' (< *tə-,*nə-ǫ-a'-x̲).

For 'many, much', along with Hale t$_{x}$lán, Gibbs klah-né, Teit łán, łān, Anderson (Tlatskanai) has Hlâi-n-, Hhlâi-n-, reminiscent of Harmon's Carrier Clyne, and accompanied by Anderson's own comparative remark "N[ew]. Caledonia Hhli or Hhlâi." (Anderson had also had contact with Carrier.)

Also very interesting are l~n alternations in the transcriptions in certain cases exactly where PA had *ǫ, both stem-initially and stem-finally, and suffixally. The

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14. Bracketed phonetics are interpretations of multiple transcriptions.

transcriptions for 'otter' show tcinê´ze (Teit), tcinä´zī (Frachtenburg); cf. Chilcotin čináž, certainly < 'longtail'; for this Gibbs (Kwalhioqua) however has che-leh-zie, with -l- clearly for *-ɢ-. For 'dog' the pattern is repeated, Hale $t_x$lin, Wickersham Klān (and klāne 'horse'), Teit łī´n (twice), t'łī´n, Frachtenberg łīn (twice), Curtis hlin, Anderson (Tlatskanai) Hlin^g (with comparative comment "N[ew]. C[aledonia]. Hlee in the upper parts, Hling in the Lower do., Chip. Slingh"), and Gibbs (Kwalhioqua) klehl. The etymology of 'star' is not identified, but here too we have Wickersham kah-nā-see, Teit ka´nesē, and Gibbs (Kwalhioqua) kah-lessie. Gibbs does not show l where others have n from PA *n, however, or for other cases of *ɢ mentioned above. The instance of this variation for PA *-ɢ- suffixally is very probably in the stem for 'inhabitant(s)', in Teit wɛla´pakote´li 'Willapa tribe, as called by the Suwa´l [Kwalhioqua]'; cf. Gibbs (1877:172) "The Upper Tsihalis. . . are known by the Willopah as Kwū-teh-ni", and Curtis Slaghátani 'Suwál prairie band, inhabitants of the village Slaghá'. Another instance, but this time with the l in Tlatskanai, is Hale tsitxaían 'old' (dialect not specified), Anderson Tsit-^hae-yâl.

Finally, Teit has two forms, as noted in 2.1.1., in which -w- appears to be the reflex of *ɢ: tsā´wił 'stone hammer or wedge', and .shwū´lɛwił 'cup'. The former looks virtually as though it were Eyak, with both elements unmistakably identified, and in view of that, the second appears very probably to end with the stem 'pour', as do terms for 'vessel' so widely in

Athabaskan. For further discussion of the interpretation of this -w- see 3.1.

It is probable that further study of the Kwalhioqua-Tlatskanai materials, in the context of improved documentation of Athabaskan, will yield more insight into the development of PA *ǫ in Kwalhioqua-Tlatskanai, especially as some of the difficult forms with w or l may now be re-viewed as possibly containing alternative reflexes of *ǫ. It seems indeed probable that Anderson's (Tlatskanai) -i-n-, -n^g, -l and Gibbs's and Teit's (Kwalhioqua) -l(-) and -w- represent traces of dialectal and/or positional variants of distinct reflexes of *ǫ in Kwalhioqua-Tlatskanai.[15]

3.0 PA *m

In the following sections we shall deal with the nasal labial, reconstructed *m (also sometimes [*w̃]), with which we shall see that *ǫ$_2$ belongs (as *ǫ^w=*m).

3.1 Stem-initial *m

Nasal sonorants have been definitely established for PA and PAE (*n, *ǫ), with a nasal - non-nasal contrast in the palatal. A labial sonorant is definitely established also. We must obviously ask the question whether there was a nasal - non-nasal contrast in the labial as well.

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15. In this connection, note also the peculiar Tutchone reflexes for *m in 'star' [^{w}ɬ], 3.2 and fn. 17.

In Eyak and some of the modern Athabaskan languages there is a w(b)/m contrast, but the m is either clearly secondary, arising only from wVn, and/or the m is marginal, its status coming mainly from loans and/or nursery terms and/or exclamations, or special semantic areas. Navajo is a good example, with e.g. -mą̀ʾs 'roll (spherical)', related to -bą̀ʾs 'roll (circular)', -mą̀ʾį̀ʾ 'coyote', -mąh 'gluttonous', -má 'mother' (< *-haʾn, cf. Eyak ʾu-maʾ, and also nursery terms), mósí 'cat'. These are virtually all the instances of m in Navajo. Chipewyan m is rare also, the best known instance being -mą 'stink'.

On the other hand, as mentioned above (1.0.), in some Athabaskan languages the only reflex of the labial is m, as in Hupa, Sarcee, Upper Kuskokwim, lower dialects of Koyukon; in many the only reflex is b, and in many of these the b has a non-contrasting allophone m (or alternates with a contrasting m in stems from *wVN, e.g. Minto bəθ 'riverbank', but bən 'lake' [bəŋ~məŋ̥] in free variation. Again, as mentioned above, some languages that have [n^d, nd, nd] from *n also have [m^b, mb, ^mb] from *w, and many develop a phonetic [m] from e.g. -n- second person singular pronoun before b-initial stems, as in Chilcotin [$ɣ^əimbiɬ$] 'you are swimming along'. Some also develop m from *Nw, as Kato <u>náme</u> '(you) swim'.

In only a few languages does the labial remain w (or v): Kwalhioqua-Tlatskanai, Kutchin, Ingalik, some Tanaina, and of course Eyak.

From the forms so far reconstructed with stem-initial labial sonorant we cannot establish a contrast between *w and *m, but on the basis of nearly ubiquitous alternations of w (or v, b, mb) in __V(X) with m in __VN, it appears probable that there was a phonetic alternation *w → [ʷ]/__VN in PA. This would of course parallel *y → [ʸ]/__VN. Just as there remained a (rather unstable) contrast between stem-initial /*yVN/ ([*ʸVN]) and /*n̲VN/, there may well have remained a contrast between /*wVN/ ([*ʷVN]) and /*mVN/, if indeed there existed an *m (as opposed to /*w/→ [w̃]). This is the question we shall now consider.

As the contrast between *y and *n̲ is much more stable and easier to establish in *yV(X)/*n̲V(X) than in *yVN/*n̲VN, so might the contrast between *w and *m be more stable and easier to establish in *wV(X)/*mV(X) than in *wVN/*mVN. In the first version of this paper we thought we had found an example of *mVX in the noun-stem 'eye', which we at that point reconstructed *w̃VX. We have since rejected that reconstruction of 'eye' for a better one, however, leaving *m still unattested for the moment.

We shall first consider the case of 'eye', however. As a full noun stem in Athabaskan this (almost) always shows the regular reflex of initial *n, but the vowel reflexes are irregular, some *e˙, some *a˙. Forms implying *a˙ are the more numerous: Koy. -noɣə', Tc. -ndá˙ɣ˙', UT -nà·gn', Han -ɮàw˙, Kut. -ndè˙, NTu. -ndá˙g, STu. -ndài', Chip. -naɣá, Hare, Brlk. -dá', Slave -ndá', Kaska -dá˙', Sek., Tahl. -dà˙',

Tsetsaut -da' (or something very similar), Hag. -ne', Car. -na, Chil. -nay (ambiguously *a' or *e'), K-T -na'yə', Gal. -da'y', other Oregon Athabaskan -nɑyɛ', Mat. -na'ge', Hupa -nawə' /-na''/, Kato -na', Apachean -ná''. Forms implying *e' are confined to South and Central Alaskan languages, Beaver, and Sarcee: At. -ne'ɢe', Tni. -nayə, Ing. -maɢ', Hol. -nay', UK, Tna. -nayə', Bvr. -dè'', Sar. -náyà'. The final of the stem is *-ɢ-, alternating irregularly with *-x̣- > *-y̰-, probably always followed by suffix *-ə'. It is clear from the tones (Chipewyan low, Apachean and Sarcee high) that the PA form had no glottalization in the vowel or the final of the stem itself, but the stem-tone is in a number of languages assimilated to that of the suffix.

The Eyak form is -la'x̣, which seems to correspond quite simply with the PA. Note however the Ingalik -maɢ', suggesting PA *-me'ɢ-. Upon considering this, we first reconstructed this with rare PA initial *w̃, especially in view of Tlingit wa'ɢ, which the PA is now finally strikingly similar to, for one of the very most convincing Athabaskan-Tlingit comparisons. If, however, we reconstruct PA *m here on the basis of Ingalik, we cannot easily explain Eyak l, which regularly corresponds to *n. It therefore appears that a better explanation is that this stem was originally a compound of the 'facial' prefix **nə- (found also e.g. in 'nose') plus a sonorant initial stem such as *-we'ɢ ~ -we'x̣. Given that *Cə-nə-we'ɢ-ə' > PPA *Cə-nwe'ɢə', in possessed forms, it is probable that it is this cluster *nw which gave rise to Ingalik m on the one hand,

*-me·ɢ-ə' > -maɢ; and on the other hand, that here *we· > *a· in most Athabaskan and Eyak, yielding *-na·ɢ/x̣, whereas in Southern and Central Alaskan Athabaskan (near Ingalik) and in Beaver-Sarcee, *w dropped without affecting the following vowel, yielding *-ne·ɢ/x̣.[16] Tlingit wa^ɢ could then be seen as a reflex of the root without the *nə- 'facial' prefix, not found in Tlingit in the first place. Strong support for this interpretation (*nw > Ingalik m) may be found in one of the very few other instances of Ingalik stem-initial m, -max̣ 'struggle, wrestle', cf. nəvax̣ (noun only) 'war'.

There is also a non-suffixed and sometimes reduced form for 'eye', occurring as the first element in compounds, more with the phonology of a prefix, *ne·(x̣)-, *na·(x̣)-, *nəx̣-, always with *n- initial, including Ingalik, and usually not > nd-, etc.; Eyak ləxə-, Tlingit waɢ-.

Those forms for which we had earlier (2.1.) posited PA initial *ʕ but which show a labial in California (*ʕ$_2$), we may now consider reconstructing as *mVX, since we no longer reconstruct 'eye' as *mVX. See 2.1. for *-ʕ$_2$əɮ 'pluck', *ʕ$_2$əł 'wedge', and derivations of *cə-ʕ$_2$əł 'stone axe', *nə-čə-ʕ$_2$əł 'flicker', *-ʕ$_2$əł 'handle pl., pour', and its

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16. There is another example of initial *w dropping after a consonant, namely where *O-ł-we·g^w > *O-le·ɮ^w 'cook O by boiling' in some Athabaskan, e.g. in At. -le·ɮ, Tni. -laɮ, Koy. -laɮ, Car. -liz; but not e.g. in Nav. yìłbé·ž, Chip. yɛłbɛz, Kut. yahviž, Hupa yəłmeɮ 'he is cooking it by boiling'. Here the dropping of *w has no effect on the following *e·; cf. Eyak -wa'k' 'soften by boiling'.

derivatives, especially *tə$\underline{ŋ}_2$əɬ 'vessel', with correspondences everywhere in Athabaskan as for *$\underline{ŋ}$, except for the California labials (contrasting with n there, as in -nes 'long', -nəs-t'e' 'body'), and Kwalhioqua-Tlatskanai -wəɬ. These may now perhaps be reconstructed *-məǯ, *məɬ.

This *m (*$\underline{ŋ}_2$) contrasts clearly with PA *w (including even [*w̃] in [*w̃ỴN]), which regularly (except for 'eye') appears as a labial in all Athabaskan; for example, there is no Athabaskan language at all in which e.g. *wən 'lake' now begins with n. *m (*$\underline{ŋ}_2$), on the other hand, remains labial only in PCA and K-T, and elsewhere merges with *$\underline{ŋ}$ (and in most languages thus further merges with *n). We have minimal or near-minimal pairs for such contrast not only in *-məǯ, *-məɬ vs. *-$\underline{ŋ}$əs- in 'body', but even more convincingly in *ma'n' 'across' vs. *wa'n'- [*w̃a'n'-] 'edge'.

It might be argued instead that *$\underline{ŋ}_2$əǯ and *$\underline{ŋ}_2$əɬ are PA *$\underline{ŋ}$vǯ and *$\underline{ŋ}$vɬ, attributing the labiality to the vowel instead of the nasal, precisely as reflected in the otherwise unexplained Koy., Tna. -nvʒ, Tnc. -ndoʒ, UT -nod, with the labiality lost in the other languages (except PCA and K-T). This development is not paralleled in *$\underline{ŋ}_2$əɬ, however. Such an explanation cannot account, in any case, for *ma'n' 'across', where the vowel is a stable *a'. This leads us to yet another possible reconstruction of *$\underline{ŋ}_2$, very plausibly *$\underline{ŋ}^w$ rather than *m, thus *$\underline{ŋ}^w$əǯ, *$\underline{ŋ}^w$əɬ (practically = *$\underline{ŋ}$vǯ, *$\underline{ŋ}$vɬ), and *$\underline{ŋ}^w$a'n'. It thus becomes somewhat easier to explain that *$\underline{ŋ}_2$ (*$\underline{ŋ}^w$) merged most commonly with *$\underline{ŋ}$, everywhere in the North (where distinct

from *n; thus perhaps never directly merging with *n, but only later with the shift *$\underline{ŋ}$ > *n), whereas it merged with *w only in Kwalhioqua-Tlatskanai and PCA (especially California).

It is perhaps interesting also in this connection that as a disjunct verbal prefix 'across' generally reflects *nạ̀'- in Athabaskan languages (not *$\underline{ŋ}$ạ̀'- or *$\underline{ŋ}_2$ạ̀'-), and 'eye' as the first element in compounds also always has initial n, i.e. Ingalik na-, not *ma-.

Unfortunately the only clear Eyak cognates are wəł for 'wedge' and most probably -'ił for 'pour', helping very little at this point to clarify the PA forms. Tlingit yi^s 'wedge' and di-ya' 'across', suggest *$\underline{ŋ}$ more than *m, but do not themselves account for the labiality. (See Addenda.)

If we reconstruct *$\underline{ŋ}_2$ as *$\underline{ŋ}^w$ rather than *m, that leaves more latitude for variation [w~w̃~m] in *wVN. On the other hand, the need for such latitude is questionable in view of the established contrast *$\underline{ŋ}$VN/[*ỹVN]. We might conceivably need both *m and *$\underline{ŋ}^w$, e.g. perhaps to account for the difference between the vowels in Tanana -nv꞉ and nəł. Obviously, in any case, we are at the point of dealing with single forms for answering such questions instead of whole classes of forms, so that the basis for and profitability of such considerations at this point becomes highly questionable. We must first now consider similar phenomena in stem-final position and defer further discussion of this problem to the concluding parts of this paper (7.1, 7.3, 7.6).

3.2 Stem-final *m

There are clear traces of stem-final *m [*w̃] rather widely in Athabaskan, but as we shall see, these are rather inconsistent, perhaps reflecting a pattern more complex than expected, and instability.

The most widespread forms by far which appear with overt stem-final *m are two nouns, '(house)fly' and 'star', both very well attested, 'star' throughout all Athabaskan, and 'fly' everywhere in Alaska, K-T, PCA, and Apachean, but not in Canada. We shall here present them both together, so that their forms may be directly compared for each language, 'star' reflecting *səm' or the like, 'fly' *dəm' or the like.

At. son', don', Tni. (Upper Inlet) sən, (Inland) səm, sim, (Outer & Upper Inlet) dəm, Ing. -ę̂en', dəm', Hol. ę̂un', dəm', Koy. ʌun', dʊn', UK sʊn' or ʂ̌ʊn', dʊn', Tna. sən', dʊn', Tnc. sə́n', dą̊ỹ', UT sə̀n', dą̊ỹ', Han są̊', dą̊ỹ', Kut. są̊', dą̊i̯', NTu. (Selkirk) θę́w', θę́l'[17], (Mayo) sán', STu. θə̀n', θę̀l'[17], Tag., Kas., Tahl. sʊn, Tset. so, Hare wę́', Brlk. Wę́', Mtn. xę́', Sl. θę́', Dogr. fę̀', Chip. ę̂θán or θán, Bvr., Chil. sán, Sar. suh, Sek., Babine, Car. səm, Hag. sən, K-T sə́ne, dəm', Ump. ba', Tol. sən'-, bən', Tut., Gal. san', ban', Hupa cən', man', Mat., BR ciŋ, dǫ' or ba', Wail. saŋ', ba(n)', Nav. sǫ́', dǫ́', WAp. sǫ́ˑs, dǫ́', KAp. sǫ́ˑ, dǫ́ˑ.

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17. A heavily labiovelarized and nasalized lateral sonorant (Ritter p.c.), transcribed θél̃n' and θyą́ɰ̃l' in Ritter's field-notes. Cf. also the Kwalhioqua-Tlatskanai n~l variation, 2.4.4.

It is obvious that labialization occurs in both these stems, but its position is also highly unstable in both. In contrast e.g. to *q^{w}ən' (=*qʊn') 'fire', which begins with a back velar, such that the labialization remains on the initial obstruent and/or the vowel, 'star' and 'fly' begin with coronals, such that the labialization is manifest in various of the three segments (or even lost altogether): in the reduced vowel as o or ʊ, in the sonorant as m (and -ỹ?), or in the initial as PCA b[18], m as in 'fly', and in those initials of 'star' which instead of *s specifically reflect *š[19] (UK, Tna., Tnc., UT, Han, Kut., STu., Chil.). Significantly, nowhere is the labialization specifically reflected in more than one segment, e.g. no reflexes of **šəm', no *bəm' or *sʊm'. In a few languages, the labialization is entirely lost in 'star' (California, Ing., Chip., and perhaps in some of the languages where the s of

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18. In the Oregon languages 'fly' is always bɑn' or bən', never showing initial m, usually constituting a minimal pair in fact with mɑn' or mən' 'hut'. In most of these languages, *w > m in all positions (Tolowa-Tututni-Chasta Costa, Umpqua), or *w > m (rather than b) at least before VN (Galice and at least sometimes in Coquille). Thus the initial of Oregon bɑn' or bən' cannot be a reflex of *w, but must rather result directly from labialization of d, or metathesis of position of labialization in the stem.

19. See Krauss 1964, 1976, for discussion of PA(E) *š as labialized *s. This early relationship obviously has some bearing on this highly unusual variation between *s and *š reflexes for the initial of 'star' in the many Athabaskan languages where the two series are still in stable opposition. Further unusual instability is reflected in the occasional affrication to *c (Ing., Hol., Koy., Hupa, some Chip.). Sapir, it turns out, apparently comes to a similar conclusion, reconstructing *sŏn̥?, *swĕn̥? (*ts'wĕn̥') in his ledger (-n̥ ="heavy" -n-).

sən('), san' could reflect either *s or *š: Bvr., Hag., K-T, Oregon). In 'fly', on the other hand, the labialization is nowhere entirely lost (unless in dąỹ'), as no language has dən' or the like.

It is probably significant also, however, that the two forms seldom show the labialization in the same position or even rhyme in languages where both forms occur (only Apachean, Atna, UK, some PCA; moreover of those where the forms rhyme, the labialization is reflected only in one of the first two segments, either in the vowel of both (Ahtna, UK, Apachean), or the initial obstruent (at least of 'fly', in PCA). Thus wherever one form has the labialization preserved in the stem-final sonorant as m (or even ỹ), the other has n: 'star' shows m in Nondalton-Lime Tanaina, Sekani, Babine, and Carrier, while 'fly' shows m in Outer and Upper Inlet Tanaina, Ingalik, Holikachuk, K-T, and ỹ in Tnc., UT, Han, Kut. Nowhere does m final appear in both.

It seems unlikely that these differences should be attributed to conditioning by the difference between the initial obstruents *d and *s. More likely it seems that we may have a situation similar to that just dealt with for stem-initial *$\underline{ŋ}_2$, where it is difficult to determine whether to reconstruct *m or *$\underline{ŋ}^w$, or perhaps both. Conceivably 'fly' was *dəm' while 'star' was *sə$\underline{ŋ}^w$' or (less likely in view of e.g. Kut. dą̃i') the reverse, *dəm' and *sə$\underline{ŋ}^w$'. Alternatively, and more likely, at least one or the other might be interpreted as *XʊN, attributing the labialization to the vowel

in one case, thus *dv$_{\underline{9}}$' and *səm', or (perhaps less likely) *dəm' and *sv$_{\underline{9}}$', or conceivably even both, *X$_1$v$_{\underline{9}}$' and *X$_2$vn' (*dv$_{\underline{9}}$' and *svn', or less likely *dvn' and *sv$_{\underline{9}}$'), thus eliminating contrastively labialized stem-final sonorants altogether. We are presented with too many alternative interpretations and only two forms. It does seem to be going too far, however, to eliminate <u>both</u> stem-final *m and *$_{\underline{9}}$ (as *$_{\underline{9}}^{w}$) simply because we seem to find this sonorant only after reduced vowels, such that the labiality can be attributed to *v. For one thing, the same cannot be done stem-initially because of *$_{\underline{9}_2}$a'n' 'across', and for another, the status of PA *v (outside of verb-stems reduced from *Cu'C) is very questionable. Thus there are (as yet) no established contrasts between e.g. *q^{w}ə- (or *q^{w}ɑ-) and *qv-, or between *-ə$\dot{x}^{w}$ (or *-ɑ$\dot{x}^{w}$) and *-v$\dot{x}$. However, see *-ɢəm' 'lukewarm' below, for possible evidence for contrast between *Q^{w}ən and *Qəm (or *Qə$_{\underline{9}_2}$).

There are certainly other Athabaskan stems with final sonorants to be reconstructed like those of 'stɑr' or 'fly'. Especially similar to the case of 'fly' is a set of forms to be reconstructed PA *-dəm', generally meaning 'bloated, distended, swollen, taut' (neuter), but of course not as widely documented, and in some cases documented only for the transitional stem set with expanded vowel, here in parentheses: At. -don' (-du'n'), Tni. (Nondalton) -dəm (-dim), Ing. (-deŋ'), Koy. -dvn' (-don'), UK (-don', progressive -dił), Tna. (prog. -duł), Kut. -dąɨ' (tone uncertain), UT (-dǫ̀''), Sar. -dǜn, Hup. -don' ('straight'), Nav. -dǫ̀n (-dǫ̀'h 'filled to a bulge', 'straighten'); Eyak -du'

'stuff'. The stem with expanded vowel reflects variously *-u'- or *-a'-, and the final sonorant is clearly *m or *$\underline{ŋ}_2$. (This stem is not to be confused with *-d-a'$\underline{ŋ}$ in 'overeat', cited in 2.1.2.3.) Documentation for this stem is also complicated by confusion with or relation to another similar stem *-dəm(') or the like, variously meaning 'booming noise, drumming noise; explode, burst, break', partly onomatopoetic, partly perhaps extension of 'taut': Ti. -dəm 'play music', Ing. -dəŋ', -dʊx̣, Koy. -dʊn' 'break', -do-x̣ 'play music', Kut. -dǫ̨' 'crash, boom', Sar. -duw 'low hollow sound', Hup. -dʊɬ 'crashing noise', Nav. -dǫ̀n 'explosive noise'; Tl. dam 'bang!'; see below concerning onomatopoeia.) Sapir reconstructs *$\underline{\text{-Don}_{\text{o}}}$ (-n_{o}="heavy"-n') 'to sound' and, most interestingly, *$\underline{\text{-Dǔn}_{\text{o}}}$, *$\underline{\text{-D}\breve{\text{W}}\text{en}}$ 'to swell'.

Another stem with similar final sonorant is *-ɢəm' or *-ɢə$\underline{ŋ}_2$' 'warm, lukewarm', but very incompletely documented: Ing. -ɢəŋ', At. -ɢon', Kut. -gi̯ǫ', Mat. -gi'n (transitional); Eyak -ɢu' 'warm', ɢu'-ɬ 'blanket'; Tlingit -ɬ-ɢu 'wipe'. The complexities of the Athabaskan correspondences, as well as the Eyak and Tlingit, suggest a relationship and ultimate identity with what was reconstructed in 2.2 as *-ɢɑ$\underline{ŋ}$ 'dry'. This further implies that there may indeed have been a contrast, however unstable, between *Q$^{\text{w}}$ən and *Qəm (*Qə$\underline{ŋ}_2$), questioned above, for stems even with back velar obstruent initial.

Similar also, perhaps ‹ *-tɑm', is Nav. -tą́', Hupa -tan', Car. -tən, Kut. -tą́', At. -ten', Koy. -tʊn', Chip. -tén impf., but pf. -tón, Ing. -təŋ', usually *O-u'- 'hold O close'; labiality widely lost, but evident still in Koy., Chip., and Ing.

One other stem which widely appears with reflexes specifically of -əm- is a kinship term distributed throughout Canada, but apparently not elsewhere, the series of forms cited by Hoijer (1956, again in Dyen and Aberle 1974) as cognate set 49, which Hoijer reconstructs as PA *-k̲wine 'son'. The various forms cited are é-tchuné, é-tchiné, -tcuu´e, -tcuume, -tcue, -tcua, -tcu̧e, -tshī̆me, -tiima, -tcu·ᵘ, -chuah, -tchuen, -tšuə, -tchwą' in a number of Canadian languages (Hare, Mountain, Dogrib, Tsetsaut, Kaska, Tahltan, Slavey, Beaver, Sekani), in many cases inadequately transcribed, but clearly enough pointing to PA *-k̲əmə.

A stem which definitely had a full vowel in PA and which may show traces of final -m or -ʔ̲$_2$ is that for 'drink', reconstructed as *-na·ʔ̲$_2$ in 2.1.2.1, 2.2. The Ingalik final -n̥ is irregular for *-ʔ̲ integral to the stem (not perfective suffix), but more puzzling is the vowel in one continuous Alaskan area, e (< *u·) in Ingalik, u in Holikachuk, Koyukon, UK, and in Tanana; Kutchin -nį· could be from either *-na·ʔ̲ or *-nu·ʔ̲. All other Athabaskan shows regular reflexes of *a·. Perhaps the PA is to be more specifically reconstructed as *-na·ʔ̲$_2$, to account for the u vowel in the one Alaskan area.

At least two other stems generally show reflexes of *-u·n' throughout Athabaskan, but sporadically instead explicitly *-əm'. One is 'mouse, small rodent', almost everywhere reflecting *ʌu·n'ə or the like (At., Tni., Ing., Hol., not elsewhere in Alaska; all of Canada, most of PCA, e.g. Hupa łoˈn /łonˈə/; Nav. ʌǫ́·'); but Tut. and Coq. łam'e (clearly shown in Jacobs.

Golla, and Harrington mss.). Eyak has łu̯ˑdiyahs 'mouse', probably a diffusion of some kind (-diyahs not identifiable). Another of this type is 'roe', reflecting *q'u'n' everywhere, but which we suspected may have had a labial sonorant final on the basis of comparison with Eyak q'əmaˑ 'roe, kidney' (cf. -q'u' 'spawn') even before we noted Tolowa k'am' (Seaburg p.c.).

There may be many more stems which cannot be specifically reconstructed with final *m or *$\underline{2}_2$ from an internal Athabaskan point of view, but for which comparison with Eyak suggests such a possibility. For example, for 'growl, snarl, snore' most Athabaskan implies *-ɣ̯^{w}ən (=*-ɣ̯ʊn): Koy. -ɣvn, Kut. -ɣon, Han, UT -ɣon, Mackenzie languages similarly, Car. -ɣ̯^{w}ən; or *-ɣ̯ɑn as in At. -ɣan, Tni. -ɣən, Hupa -wan; or *(-ɣ̯^{w}ɑn~) *-ɣ̯^{w}aˑn as in Ing. -ɣ̯^{w}ən~-ɣon, Gal. -gąˑ, Nav. -ɣ̯ą́ˑ; but Chip. -ɣun, Mat. -g^{w}oˑn, apparently < *-ɣ̯uˑn. Cf. Eyak -x̯əmaˊ 'growl', x̯əwaˑ 'dog', suggesting PAE **-x̯am (though see also 7.2 for an alternative explanation).

Finally, some Athabaskan languages, e.g Tanaina, Carrier, Galice, have fairly common overt stem-final m. They may be onomatopoetic and/or may reflect PA stem-final *m. Note that in all cases the vowel reflects *ə, final labial sonorants having been usually lost after full vowel (see above). Examples besides those mentioned above follow for Tanaina, Carrier, and Galice.

Tanaina cases are particularly well documented for two dialects, Nondalton (N) and Kenai (K): -dəm 'play musical

instrument' (K), 'loud hollow noise' (N), dənldəmi 'musical instrument' (N); -təm (K) (-təni N) 'thunder', -təm (N) 'bounce, fall', təma (K) 'slush ice'; -t'əm 'foggy, bloated; pack down hard' (K, cf. Ahtna -t'on 'pack'), 'cloudy, congested (chest); pinch off' (N); -ʒəm (K) 'chubby', dɣəlʒəma (K) 'redneck clam', duʒəmi (K) (duʒəni N, see 'loon' 2.2) 'loon'; -qaluč'əma (K), -qalač'əma (N) 'little toe', -luč'əma (N) 'little finger'; qałč'əma (K, N) 'butterfly'; q'ačəma (N) 'willow ptarmigan' (cf. widespread q'a̰'c'əwa'); dəlɢəma (K) 'ptarmigan'; k'kulužəm'a (K) 'gizzard', -ʒižəma 'eardrum, hearing'; k'ɣalɢəma (N) 'fish heart'; ləm 'penis' (N) (childish); k'dəma (K) 'penis' (slang); ƛ'əm (N) 'fart' (childish, cf. ƛ'ət'); šəma (N) 'hot, sweat'; gəm'a (Outer Inlet) 'godparent'. (V.addenda.)

Morice lists a number of Carrier examples: -dəm 'crackling noise', -t'əm (especially a Babine form, -t'ə'm) 'small', -məm 'hum', łəm 'ice' (mentioned above), -zəm 'gland' (cf. Tanaina -žəm- in 'gizzard', 'eardrum'), -k'əm 'eat crunchy object', -ɣəm 'eat ice; thick (of forest)', -ʎəm 'sleek', -čəm 'branch, knot', -gəm 'aquiline'. Story (1978.21-22) has some interesting discussion of Babine and Carrier labial-final stems, comparing Babine -t'ə'm with -t'og 'short', paralleling -t'ub ~ -t'əb 'bite (of insect)', -t'ug ~ -t'əg 'suck', -čəb 'spoon', *-k̲ᵛg < *-k̲ů'd+g̲, and comparing -zəm 'gland' with -zo 'castor' (< *-zəɣ̥ʷ, cf. At. -zoɣ 'scent gland').

Galice examples are fewer, perhaps only because of poor documentation: -tam 'spotted; plant crops', -č'am' 'pierce with arrow; drip; claw at', and finally, a nice cognate with Carrier-

Babine, -t'am 'small; jump' (latter gloss probably incorrect; cf. Tut. (Golla) -tam' 'jump', Hupa -ton' (=-tʊn'); cf. Tni. -təm 'bounce'). To these may be added or compared Tol. (Seaburg) -təm' 'plant seed', -t'əm' 'to be thin, to be small; to untie, unwrap, unravel', me't'əm' 'prairie, field', -č'əm' 'drip; itchy, sticky', -c'əm' 'lick, kiss'. Some instances of -t'əm' may be from *-ƛ'un'. Forms such as these need further documentation and investigation. The wide geographical spread of these languages, the vague semantic and phonological similarity of the items, pairs such as ƛ'ət', ƛ'əm 'fart', tən, təma 'ice', the predominance of onomatopoetic, expressive, childish, and diminutive forms, seems to indicate that PA itself may have had a productive process of stem-formation for these special types, yielding the form *Cəm.

4.0 Table and Summary of Stem-initial Sonorants

The following table summarizes the stem-initial development of all the sonorants discussed in sections 1-3, viz. *w, *m, *n, *ŋ, and *y; also *ɣ̂ (but not *Ø, the development of which is too complex for convenient inclusion in the table). There is at least some difference in most Athabaskan languages in the development of stem-initial sonorants depending on whether the stem-vowel was followed by a nasal or not, most often in the case of *y, and in some languages there is a difference in the development of all the sonorants (but never of *ɣ̂) depending on whether the stem-vowel was followed by a nasal or not. The

table is therefore divided into two sets of columns, in the first of which the development in __V(X) is shown, and in the second that in __VN.

Where two or more languages within the same general geographical area show the same development, they are collapsed together in the table. Documentation for all such correspondences in all the languages mentioned here has not been included in this paper, e.g. for *wV(X), *wVN, but is widely available for most and has been checked in sources on file at ANLC. Where data available to us are not adequate for determining the development, especially of *mVN and *ŋVN, a blank has been left. However, in some cases, where a language has been collapsed with others, e.g. most of Oregon (including Umpqua, but not Galice) with Tututni, most of California (except Hupa) with Mattole, again such collapsing is done on the basis of the other items.

To give a graphic notion of the contrasts preserved as opposed to the mergers that have taken place, a vertical line has been drawn where there is still some contrast stem-initially between the reflexes of the PA(E) sonorant. Where the contrast is partial or uncertain the line is dotted.

No language has kept all the sonorants distinct. Most have kept *w distinct as a labial, merged all the nasals (m n ŋ) into one (n) and kept *y distinct in *yV(X), always merging it here with *γ, but in *yVN usually merging *y instead with the nasal. Only one item seems not to have changed in any Athabaskan language, *n in *nVN.

Contrasts for *$\underline{ŋ}$ and *m are the least stable. No language has distinct unique reflexes for both. Everywhere in the North, where *m and *$\underline{ŋ}$ are not merged with *n, they are at least merged with each other (as a palatal, not a labial, implying *m > *$\underline{ŋ}$ at some stage in the North): Ingalik ŋ; Kutchin n$\tilde{ʒ}$; Hag.-Car. y (merged with *y). We thus made the distinction between the present *m (not 'eye') and *$\underline{ŋ}$ only during the most recent stages of writing the paper, purely on the basis of the evidence from Kwalhioqua-Tlatskanai and PCA (especially California), after the reconstruction of 'eye' was revised from *-m- (*-$\tilde{w}$-) to *-nw-. The identified examples of *m boil down to only four: three for *mVX ('wedge', 'pour', 'pluck'), and one for *mVN ('across'). Eyak clearly has wəł for 'wedge', but apparently -'ił for 'pour', no clear cognate for 'pluck' or 'across', and Tlingit has yi^s for 'wedge', -ya˙ for 'across'. The evidence outside Athabaskan thus does little so far to clarify the PA.

Note that the Eyak pattern differs fundamentally from the Athabaskan, strongly tending to denasalize, but maintaining position of articulation.

Some examples for *wV(X) are PA *-we 'sg. swim', *wəs 'riverbank', *-wə̀t' 'belly', *we˙š(^{w}) 'knife', for *wVN are *-we˙-$\underline{ŋ}$ 'sg. swim (pf.)', *wən 'lake', *wən' 'hut', *-wa˙n'ə 'edge', generally not documented in this paper. Examples for *mV(X) (=*$\underline{ŋ}_2$V(X)) are, as noted, only PA *məł 'pl. fall, pour' and derivatives ('vessel'), *məł 'wedge' and derivatives (e.g. 'knife', 'stone axe', 'flicker'), *-mə$\tilde{ʒ}$ 'pluck', and for *mVN only *ma˙n' 'across.' Examples for *nV(X) are *nu˙ 'island',

*-nə̀q' 'swallow', -nì·g 'take'[20]; for *-nVN are *-ne·n' 'face', *-na·ŋ$_2$ 'drink', only a few of which are documented in this paper. Examples for *ŋ (remaining after the distinction of those with *m) in *ŋV(X) are *-ŋé·z 'long', *-ŋəs-t'e' 'body', *-ŋa·t' 'fish flesh'; also *ŋəl-i· 'scoter', *-ŋəʎ' 'throb', if not *m; those for *ŋVN are *ŋən' 'land', *ŋe·n' 'moss', and *ŋən 'you'. Some examples for *yV(X) are *ya' 'louse', *-ya·ž(^{w})- 'small, woman's child', *yəχd 'house', *yəχs 'snow' (the latter two are documented in 6.3.1), but the only clear ones for *yVN are *-yən- 'back, spine', *-ye·n 'sharp', and *-ya·ŋ in 'ten'. Examples for *ɣV(X) are *-ɣuʎ' 'blow', *-ɣəc'- 'hill', and for *ɣVN are *-ɣa·ŋ 'grow old, wise', *-ɣən- as in *də-ɣən-ən 'shaman' (see 2.1.2).

To construct a table for stem-final sonorants would be a much more complex task with less amenable results, since although we have posited essentially the same sonorants stem-finally as stem-initially, their development has been of a rather different nature. Instead of tending to become obstruents, as they do stem-initially, where articulation of the Athabaskan word is maximum fortis, and where they show only minimal interaction with the stem-vowel, stem-finally they do just the opposite, (nasals) tending to become non-occlusive, to interact with the vowel, their features combining with those of the vowel, and/or to delete entirely as discrete segments. This will become still clearer in the following discussion of ablaut and nasalization.

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20. The *n in e.g. *nà·-tV- 'two' and *də-ne· 'person' often do not develop regularly as a stem-initial, where morphological structure is not clear.

Table of Stem-initial Sonorant Correspondences

PA __V(X)	*w	*m	*n	*ŋ	*y	*ɣ	__VN *w	*m	*n	*ŋ	*y[7]	*ɣ
Ing.	v	ŋ	n	ŋ	y	y	v	ŋ	n	ŋ	ŋ	y
At.,Tni.	b	n	n	n	y	y	b	n	n	n	y	y
Tni.	v	n	n	n	y	y	v	n	n	n	y	y
Hol.,UK	m	n	n	n	y	y	m	n	n	n	y	y
Koy.,Tna.	b	n	n	n	y	y	b	n	n	n	n	y
Mackenzie[1]	mb	nd	nd	nd	ž	ž	m	n	n	n	n	ž
Hare	b	d	d	d	y	y	m	n	n	n	n	y
Kut.	v	nž	nd,nž	nž	ž	ž	v	n	n	n	n	ž
NTu.(Mayo)	m	n	n	n	ž	ž	m	n	n	n	n	ž
STu.	mb	nd	nd	nd	y	y	m	n	n	n	-2	y
KTSB[3]	b	d	d	d	y	y	m	n	n	n	n	y
Tset.	b	d	d	d	x	x	m	n	n	n	-2	x
Chip.,Chil.	b	n	n	n	y	y	b	n	n	n	n	y
Sar.	m	n	n	n	y	y	m	n	n	n	n	y
Hag.,Car.	b	y	n	y	y	y	b	y	n	y	y	y
K-T	w	w	n	l?,n	y	y	m	-2	n	n	y	y
Ore.[4]	m	n	n	n	y	y	m	m	n	n	i,-2	y
Gal.	b	d	d	d	y	y	m	-2	n	n	i,m,Ø	y
Hupa	m	m	n	n	y	y	m	m	n	n	y,m	y
Cal.[5]	b	b	n	n	y	y	o	b	n	n	y,b	y
Nav.	b	n	n	n	y	y	b	n	n	n	i,n,b	y
WAp.	b	nd	nd	nd	y	y	b	n	n	n	n	y
KAp.	b	n[6]	d,n	d,n	ž	ž	b,m?	-2	n	n	-2	ž
Eyak	w	w	l	y	y	x	m	-2	l	y	y	x

1. Tnc., UT, Han, NTu. (Selkirk), Tag., Dgr., Sl.

2. Data lacking; guess for opposition line based on areal considerations and/or patterns in __V(X).

3. Kaska, Tahltan, Sekani, Beaver.

4. Including Umpqua, but not Galice.

5. All California except Hupa.

6. Initial d and n variously for *n and *ŋ, not explained. Lack of d for *m not significant; limited data (Bittle 1956).

7. See 2.1.2.2 for details of multiple reflexes in PCA and Apachean.

5.0 Ablaut and Nasalization in Athabaskan

The following discussion of ablaut and nasalization will show Athabaskan stem-final sonorants intimately involved in these processes. Both ablaut and nasalization, along also with constriction, may be classed as manifestations of a single process in the development of PPA into PA, suprasegmentalization (or "blending", or "smearing"): i.e., weakening of the sequential segmental articulation of post-vocalic segments as such in the stem, so that features of them become articulated simultaneously with those of the vowel. Thus in constriction, *V' > *V̓·, in ablaut e.g. *ay > *e·, in nasalization e.g. *ən > *į·. (For the development of all three of these processes, especially with reference to verb-stem variation, see Leer 1979. For the development of tone from constriction, especially in nouns, see Krauss 1978.)

5.1 Ablaut

A major addition to the theory of Athabaskan sonorant evolution is discussed in Leer's Proto-Athabaskan Verb Stem Variation, Part I: Phonology (1979) under the heading "Ablaut", and more generally in the whole of 2.3 of that work. Here Leer postulates PPA stem-final *y and *w which were dropped in full-vowel stem-variants, but which blended with reduced vowels yielding full vowels which in some cases differ from the original stem vowel. Because of the extensive treatment of ablaut and related phenomena in that monograph, the discussion of them here will be relatively brief.

The ablaut hypothesis simultaneously accounts for (1) the paucity of stems ending in original non-nasal sonorants in PA,[21] (2) the existence of perfective stems which lack the usual perfective suffix *-Ø after full-vowel stems, and (3) the evolution of ablaut-type vowel alternation in Athabaskan verb stems.

Thus for example a PPA stem of the shape *Ca'y in most environments was susceptible to reduction to *Cay, yielding PA *Ce' (by blending). As discussed in Leer 1979.38, 64, the PPA perfective suffix (represented as a morphophoneme *-Ỹ=*-N̰) had a vocalic allomorph following a closed stem, and blocked reduction of *CV'R stems: then the perfective stem *Ca'yN̰ > *Ca'y (by dropping the perfective suffix) > *Ca' (by dropping final non-nasal sonorant following full vowel). Likewise in the long glottalized stem PPA *Ca'y', final *y was dropped yielding PA *Ca'' = *Ca'. These forms can be directly compared with analogous forms from stems ending in *n. Taking for comparison PPA *ɬ-ha'y 'classif. pl. objects' and *-ta'n 'classif. sticklike object':

	PPA		PA	
reduced:	*ɬ-hay	*-tan	*-le'	*-tən
with *-N̰:	*ɬ-ha'yN̰	*-ta'nN̰	*-la'	*-ta'n
long glottalized:	*ɬ-ha'y'	*-ta'n'	*-la'	*-ta'n'

21. No full-vowel stems ending in original *y or *w are found in PA; and of reduced-vowel stems a final *y is found only in a few nominal and neuter verb roots of the shape *Cəy('), where C is a back velar.

Hence ablaut is attributable to stem reduction (blocked by the perfective suffix *-N̰ and in the long glottalized stem-variant), which is still observable in stems ending in *n.

In the following chart, theoretically possible combinations of full vowel plus non-nasal sonorant in PPA are given together with their reduced counterparts. To the right of these are given the results expected for PA. This list thus comprises the ablaut pairs theoretically possible in PA. Pairs not found in active stem sets (where reduction is possible) are enclosed in brackets.

PPA		PA	
full	reduced	full	reduced
[i˙y	əy	i˙	i˙]
[e˙y	əy	e˙	i˙]
a˙y	ay	a˙	e˙
[u˙y	uy	u˙	?]
i˙w	əw	i˙	u˙
[e˙w	əw	e˙	u˙]
a˙w	aw	a˙	a˙
[u˙w	uw	u˙	u˙]

Of the theoretically possible combinations shown above, only two produce ablauts still active in PA, namely *a˙/*e˙ from *a˙y, as in *-la˙/-le˙ ‹ *ɬ-ha˙y 'handle pl. objects, rope' and *-na˙/-ne˙ ‹ *-na˙y 'move'; and *i˙/u˙ from *i˙w, surviving only in *-ʌi˙/-ʌu˙ ‹ *də-ɬi˙w 'freeze (to death)'.

A distinct type of ablaut is seen in stems which have PA *a˙ɳ/e˙ attributed to PPA *a˙ɳ, where the reduced variant falls together with the reduced variant of PPA *a˙y stems, *aɳ > *ɑɳ > *e˙.[22] This development again reinforces our claim that PA final *ɳ was articulated with incomplete oral closure, phonetically [ỹ]; hence *ɑy and *ɑɳ merged during their development of ablaut in active stem sets. Such are *-ɣa˙ɳ/-ɣe˙- ‹ PPA *-xa˙ɳ 'grow' and *-za˙ɳ/-ze˙- ‹ *-sa˙ɳ 'tan (hide)'.

Note, moreover, that none of the ablauting stems begin with uvular consonants, which apparently preserve the quality

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22. However, one noun, 'wart', appears to provide widespread evidence of PA *ę˙, a phoneme which is elsewhere not attested except in isolated instances peculiar to an area. (In Navajo, for example, we note 12 items with ę, but of these 10 begin with a velar (including y = ɣ), and end with s, z, š, ž. The sole exceptions are sę̀˙s 'wart' and the "coyote word" -žę́˙~-žę́ɬ 'done (cooking)'. The data for 'wart' are Aht. ye˙s, Ti. sas, saχ (!), Ing. (Yukon) saθ, (Kuskokwim) saʒ, Koy. sał, UK šaʂ, Tna. šaθ, Tna. (Salcha) šąθ, Tnc. še˙θ, UT ša˙h, ši˙h, šeah, Han. šuh, Kut. šɬąh, Hare wę́', Chip. šɬ́θ, Car. šis, Nav. sę̀˙s, Hupa yec'; compare Eyak (-)sɬ˙s 'mold'. A provisional reconstruction is PA *χę˙c' > *χę̀˙s (the non-spirantized form found only in Hupa and possibly Kuskokwim Ingalik). This is perhaps by origin a suffixed form of *χa˙ɳ 'grow', where reduced PPA *χaɳ-c' 'growth, wart' underwent ablaut to *χę̀˙c'. A *-c' has been shown (7.5, end) as a verbal suffix in *-t'e˙-c' > t'ę̀˙s 'roast' (imperfective), perfective *-t'e˙ in most languages, but a widespread and practically unique irregularity. If this etymology is correct we may infer that the ablaut PPA *aɳ > PA *e˙ had an intermediate stage *ę˙, a vowel rare in comparison with the other nasalized vowels. This vowel could simply have become denasalized in verb stems, thus reducing the number of productive ablauts. In other words, assuming that an ablaut *a˙ɳ/*ę˙ (‹ *aɳ) had existed alongside *a˙/*e˙ (‹ *a˙y/*ay), the dēnasalizatīon of *ę˙ would have allowed the merger of these as a single *a˙/*e˙ ablaut. But the noun *χę̀˙c' would not have been subject to the pressure of analogy (become progressively less analyzable during the transition to PA), thus preserving uniquely the transitional phoneme *ę˙.

of the following vowel, thus preventing ablaut. Thus for example the roots *-ɢay 'white' and *-ɢaŋ 'dry' remain *-ɢay and *-ɢaŋ in PA; the latter undergoes not ablaut but nasalization to *-ɢą'- before an obstruent suffix.

PPA *a'w > PA *a'/a' is postulated for stems which do not exhibit ablaut but lack an overt perfective suffix in PA, such as *-ha'w 'singular goes'.

It should be stressed that ablaut is found only in active stem sets, never in neuter or transitional stem sets. Thus neuter stems are reconstructed with final *y, *w only on the basis of whether they lack the perfective suffix *-ŋ in PA. Such are PPA *-'a'w 'extend', *-da'w 'sg. sit', *-qe'w 'pl. sit', *-t'e'w 'be (thus)'. Since there is no ablaut vowel to indicate what the original sonorant was, we must resort to other evidence. Fortunately Eyak cognates shed light on some of the above:

PPA	Eyak
*-'a'w 'extend'	- a' 'extend, -'a'w 'long'
*-qe'w 'pl. sit'	-qu
*-t'e'w 'be (thus)'	-t'e~-t'u[23]

23. -t'e in neuter imperfective (without obstruent suffix), -t'u elsewhere. This is practically the only case of open-stem ablaut in Eyak (*-t'e·w# > -t'eh, *-t'əw- > -t'u-). One other is in two homophonous stems -'e~-'ą 'see, travel', and 'call' (with O-'ihx̣,'imitate O'), *-'e·n# > -'eh, *-'ən- > -'ą-; cf. PA *-'e·n 'see', *-lə-'e·ŋ 'consider (to be such), imitate'. See further 7.2.1 for -'ā·w~-'a', -'ləw~-'li', and 7.3.2 and fn. 30 for the development of Eyak final sonorants and ablaut-like phenomena.

Additional confirmation of the last stems is found in the Carrier neuter imperfective stem-variant, given by Morice as ṭorh (implies -t'ox, modern -t'oh) rather than the expected *-t'e or *-t'i.

Thus we can reconstruct with some degree of confidence PPA stems ending with *a˙y, *i˙w, *a˙w, *e˙w, with ablauting stems attributable to the first two. It is not clear why there is no ablaut *e˙/u˙, as would be expected from PPA *e˙w for active stem sets.

The theory of ablaut can be extended, of course, for explaining many of the complexities in the vowel correspondences between Athabaskan and Eyak. A few examples are PA *-ƛ'u˙ 'bind' (perfective *-ƛ'u˙-n̲), Eyak -ƛ'i < PAE **-ƛ'iw; or PA *-la˙/-le˙ 'handle pl.', Eyak -ł-a; *-na˙/-ne˙ 'move', Eyak -la; non-ablauting in Eyak, where regular overt reduction in verb-stems does not occur, and the *-y is lost. Similarly PAE **Ca(˙)y may explain some noun-stem vowel complexities, as PA *ce˙ 'stone' < PPA *cay, Eyak ca˙, or correspondences in closed stems, as PA *-k̲å˙ʒ̓/-k̲e˙š 'make soup', Eyak ka˙ʒ̓ 'soup'; or conversely PAE **Ce˙w(X), PA *Ce˙(X), Eyak (and Tlingit) Cu˙(X) correspondences mentioned above and (in closed stems) in 6.4 below. To these may be added e.g. PA *-ɣ̣a-' 'fur', Eyak -x̣u', where this time Tlingit x̣a^w suggests PAE *-x̣aẘ (see 7.3.2, 7.5 (end)).

(See Addenda.)

5.2 Nasalization

It should be stressed from the outset that nasalization is not a uniform feature which can be attributed to a single PA source. There is in fact clear evidence that Athabaskan nasalization has at least two major sources. The first, which will be discussed in this section, is nasalization arising from suffixation of an obstruent suffix to a root ending in a nasal sonorant. Such nasalization is attributable to PA. Thus, for example, the sequence illustrated by PA *-tan-ɬ > *-tən-ɬ > PA *-tį'ɬ 'classif. sticklike object' (prog.) may be dated before the split of Athabaskan into dialects, since all languages show here a reflex of *-tį'ɬ, whether or not they retain the nasalization; none retain the sequence *ən as distinct from *į'. This type of nasalization is quite regularly found in most Athabaskan which has nasalized vowels (including Apachean, Eastern Canadian, Chilcotin, and Galice); it is, however, not found in Eastern Alaskan languages which elsewhere have nasalization (Alaskan Kutchin, Upper Tanana, sometimes Tanacross, and sporadically Mentasta Ahtna).

Nasalization arising from suffixation is to be distinguished from stem-integral nasalization. Here we find considerable variation from one language to another (see 6.4) One thing that is clear, however, is that in the Eastern Alaskan languages named above which lack nasalization from the first source, stem nasalization is attributable in part to broken stems in PA, i.e. stems of the shape *CəNəX. Compare for example the reflexes of PA *-tį'-ɬ above with

*(tu˙-)tə̨ə̨ł '(water) pail' in these languages (Holikachuk and Chipewyan included for comparison).[24]

PA	*-tɨ˙ł	*(tu˙-)tə̨ə̨ł	
Kutchin	-čia˙	čion-tɨą̨h	'cup'
Upper Tanana	-ti˙ł	tu-tɨ˙ł	"
Holikachuk	-teł	tə̨ə̨ł	'pail'
Chipewyan	-tɨł	təli	'kettle'

Nasalized stems arising from broken stems are of later origin, and tend to be more diverse in their reflexes. They may not be nasalized in languages which elsewhere have nasalization; as with Chipewyan təli 'kettle'.[25]

Nasalization due to obstruent suffixation results in PA *ɨ˙, *ą˙, or *ų˙ (but generally not *ę˙; see fn. 22). Any front vowel (PPA *i˙, *e˙, *ə) followed by a nasal sonorant yields *ɨ˙; a back vowel (PPA *u(˙)) followed by a nasal sonorant yields *ų˙ (note also that PPA *əm reinterpreted as *ʊn yields *ų˙). A low vowel (PPA *a(˙)) followed by a nasal sonorant yields *ɨ˙

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24. Furthermore, a stem which is nasalized in Navajo is often not so in Chipewyan, or vice versa, as for example Nav. -t'ą́˙z but Chip. -t'az, Hare -t'a 'cut' (perf.). The status of such sporadic nasalization is unclear, and may be for the most part innovative. A clear case of innovation by analogy is found in Nav. hą̃nályɣɨ˙h 'he is resting', as if from 'thaw'. Elsewhere in Athabaskan, however, the root of this theme is clearly identical with that of 'breathe', Nav. -ʒi˙h (with D-effect). See 6.4 for further discussion of such innovative nasalization.

25. For further discussion of broken stems see 6.2, and for more general discussion of stem-integral nasalization see 6.4.

unless preceded by a uvular, where *ą˙ obtains. An interesting exception is that PPA neuter stems of the shape *Ca˙ǫ nasalize to *Cą˙-, whether preceded by a uvular or not. Thus in the transitional stem sets of PPA *-ła˙ǫ 'be many' and *-xa˙ǫ 'be mature, wise', we find PA *-lą̓˙- and *-ɣą̓˙- as the reflexes of PPA *-ła˙ǫ'- and *-xa˙ǫ'- before obstruent suffixes, but in the durative (active) stem set of PPA *(də)-na˙$ǫ_2$ 'drink' we find PA *-nɨ̓˙- as the reflex of *-na˙$ǫ_2$'-.

Thus PPA roots of the shape *Ca˙ǫ have three possible obstruent-suffixed reflexes. In active themes, reduction of the stem vowel takes place before obstruent suffixes yielding the ablaut *Caǫ- › *Ce˙-. If the stem of an active theme was long glottalized, *Ca˙ǫ'- › *Cą̓˙- if *C is uvular, otherwise *Cɨ̓˙-. If the stem of a neuter theme was long glottalized, *Ca˙ǫ'- › *Cą̓˙- in all cases.

5.3 Status of *əy and *əw

The "paucity" of PA roots ending in non-nasal sonorants has already been mentioned above (5.1, and fn. 21). It has been shown that *y and *w are always deleted after full vowels, and that after reduced vowels *y clearly remains as such only in Cay('), where C is a back velar, as in *q'ay' 'willow'. Otherwise, from the discussion of ablaut (5.1) and from Athabaskan-Eyak comparisons, it is clear that PPA sequences of reduced vowel plus non-nasal sonorant yield full vowels in PA, thus *ay, *aw, *əw yield e˙, a˙, and u˙ respectively. It follows that sequences of Cə$y^{\#}_{C}$ or Cə$w^{\#}_{C}$ do not occur, or more

precisely, that such sequences do not occur in contrast with $Ci^{\cdot}_{C}^{\#}$ or $Cu^{\cdot}_{C}^{\#}$, such that [i˙] and [u˙] may still be interpreted as /əy/ and /əw/. This appears to be very much the case yet in many modern Athabaskan languages.

We shall first consider the case of -əw, essentially simpler than that of -əy (as with -əy there is the added complexity of possible merger or confusion with -əy̲, -əx̲, whereas with -əw there is of course no homorganic obstruent). There are sporadic forms at least in Oregon which show such interpretation of extremely widespread stems which are normally represented Cu(˙), e.g. Galice c'awe' 'breast', widely elsewhere c'u˙, -c'u(˙)', and tawe' 'juice, soup', elsewhere tu(˙) 'water', -tu(˙)'. Perhaps in a number of other languages which show syllabic suffix, that suffix is preceded by a glide, and the stem-vowel may be reduced or not contrastible with u, thus e.g. -Cuə' = -Cuwə' = -Cəwə'. This may have been or may still be the case in Galice. The relationship between *tu˙ and the disjunct prefix *tə̀˙- 'into the water' (Eyak ta') may perhaps also be explained similarly.

Here we may note also łu˙ (-lu˙, łu˙-) 'ice, icicle, glacier, hail', found practically everywhere in Athabaskan (sometimes as łu˙d, probably influenced by *łu˙t' 'scab'), but in one area, Sekani, Carrier, Hagwilgate, where (when not in compounds) its form is łəm. Since the stem nowhere reflects *łu˙N, and is very probably related to the ablauting stem PA *-ʌi˙/ʌu˙ 'freeze' ‹ PAE *də-łi˙w (see above), the

nasality in łəm is not original, and the form most probably reflects łəw. Eyak ła' 'glacier' may well be cognate.

The widely attested PA stem for 'spruce' was *č'əwə, probably originally *č'əw-ə rather than the also widely attested *č'ə-we', since there is no known or likely analysis as such, or any likely prefix *č'ə-. Instead the form was probably reinterpreted to avoid the problematical sequence, as in At. c'abe'-, Tni. č'ba-, č'va-, Hol., UK c'əma, Koy., Tna. c'əba, Kut. c'i(')vi', K-T c'əwe', Hupa č'əme'-, BR t'cɑbbɛ-, Kato t'cūbe, t'cībe. At least Ingalik c'əvə- reflects *č'əwə-, and a number of languages show [c'o(ɣ)^{w}(ə)] (perhaps = /c'əɣ^{w}ə/) or [c'o'], contrasting with [c'u'], as UT, Han c'o', and probably a number of Canadian languages, including NTu. c'ok (cf. sdok < Engl. 'stove'). Many others, however, such as Chipewyan c'u and Navajo č'ó, show a reflex indistinguishable from that of *č'u'. Note, moreover, Haida (Skidegate, Masset, Alaskan) c'u' 'red cedar', a diffusion, if related; likewise, however, Alaskan Haida c'á'ma's 'fir' (Haida c' = č').

The interrogative pronouns 'who?' and 'what?' tend to be unstable in much Athabaskan, but the most widespread forms (which also have clear cognates in Eyak and Tlingit) involve -w- for 'who?' and -y- for 'what?' in ways that are interesting in connection with ablaut and the present problem. They are difficult to reconstruct with precision, but involve sequences of *(dɑ-)wə(-d-), *(dɑ-)yə(-d-) or the like, with d(V) element at least preceding or following, or both.

Athabaskan forms are here listed in the order 'who?', 'what?': At. bede, yedi, Tni.(Inland) vada, yada, Ing. dəva, Hol. dəma, Koy. dəba, UK mada, yada, Tna. dəba(-do), dəya(-do), UT, Han dð˙, dǐ˙, Kut. ǯǔ˙, ǯidǐ˙, Hare meni (< *medi ?), yedi, Tahl. məda, yəda, Tset. ma' ('who?'), K-T day- ('what?'), Ump. tónti ('who?', Hale), Hupa dan-d, day-d or dəy-d, Mat. dando, dí˙do, Kato danǯi, diǯi. The PCA forms for 'who' with nd may be from assimilated md, especially as suggested by the Umpqua vowel. Eyak and Tlingit cognates are clear: Eyak du˙-d 'who?', and de˙-d 'what?'; Tlingit 'a^du˙ (sa) 'who?', da^ (sa) 'what?'.

We shall summarize and demonstrate the complexity of the situation with stem-final y in $əy^{\#}_{C}$ or $i˙^{\#}_{C}$ by presenting the forms for 'wind', 'birch', and 'spruce hen', for a large number of Athabaskan languages. For PA 'wind', 'blow', may be reconstructed *-č'^{w}əy = *-č'^{w}i˙, but for PAE it was most probably *k'^{w}əy (not *k'^{w}i˙) in view of Eyak k'u˙y 'wind' (cf. Eyak xi˙l 'shaman', PA *χən, for the lengthening, and lengthening for Eyak k'^{w}ə- is regularly attested, synchronically still, as k'u˙-). Sapir reconstructs the stem *-t'ci in his ledger. The stem for PA 'birch' probably rhymed with 'wind', *q'əy = *q'i˙, though there are differences in many of the modern languages, probably due in at least some cases to the back velar initial. Clear cognates for 'birch' are unfortunately not found outside of Northern Athabaskan, or in Eyak. For contrast we include PA *dəx spruce hen, grouse', which practically everywhere reflects

a final voiceless fricative, but which we shall see now rhymes with 'wind', and/or 'birch' in a number of languages, especially the Alaskan, where 'wind' and/or 'birch' now end with a devoiced or breathy absolute final allophone of /y/ [x̲, š, ih] (merged with the reflex of final /*x̲/ in Alaskan languages except Ahtna and Tanaina).

Forms follow for each language in the order 'wind, birch, spruce hen': At. -c'i˙, q'ey, (Mentasta) dex̲, Tni. (Outer Inlet) -č'əɣ̲, (Upper Inlet, Inland -č'əy), q'əy, Ing. -č'əy˙, (Yukon) q'əx̲, (Kuskokwim) q'əy˙, (Kuskokwim) dəx̲, Hol. -c'əx̲, q'ix̲, dəx̲, Koy. -c'ix̲ or -c'əx̲, q'ix̲, dəx̲, UK -ç'əš, k'iš, dəš, Tna. -ç'əx̲, k'əx̲, dəx̲, Tnc. c'əy, k'ɨ˙, dəy, UT c'ay, k'ɨ˙, day, Han -ç'ey, k'ey˙, dey, Kut. ç'ai˙, k'i˙, dąɨh, NTu. -c'i, k'i, di, Hare -c'i, k'ɨ, dih, Brlk., Sl., Tahl. -c'i, k'i, dih, Tset. -f̂'e, dix̲-, Chip. -c'i, k'əih, dih, Bvr. -č'Ī, k'iš, ǯih, Sek. -c'Ī˙ (Young), Hag. -c'əy, k'əy, dix̲ (dəx̲?), Car. -c'i, k'i, -dih, Chil. -c'i, č'i, dih, Sar. -c'i, K-T -c'əy, Gal. -c'ɨ˙, daš, Hupa -č'e, dəW-, Nav. -č'Ì, dÌh, WAp. -č'Ìd or -č'Ìg, dÌ˙hÌ.

Outer Inlet Tanaina -č'əɣ̲ is problematic when compared with Eyak k'u˙y 'wind'. In the southern dialects of Tanaina (especially Outer Inlet), there is a contrast between stem-final ɣ̲ and y, which it would be tempting to view as a vestige of the PA contrast, lost everywhere else. However, by comparison with Eyak k'u˙y we should expect PA *-č'^{W}əy for 'wind'; Tanaina

-č'əɣ̲ is precisely the wrong outcome. Furthermore, it appears that at least in verb stems, PA *ɣ̲ may be replaced by *y in Outer Inlet Tanaina (especially where the stem-initial is uvular?). Thus, for example, we find (impf./perf.) stem pairs like -q'aɣ̲/q'ay 'slice; glide' and -quɣ̲/qəy 'chop; kick', vs. -caɣ̲/cəɣ̲ 'act with end of sticklike object' and -cuɣ̲/cuɣ̲ 'dry'. In all these cases, we would expect the perfective stem to end in *ɣ̲. The details of these developments, as well as the complexities exemplified above by 'wind', 'birch', 'grouse', still require painstaking investigation.

Significant also is that in Hagwilgate and Carrier, where *ŋ̲ > y, the resulting sequences of *əŋ̲ > əy also rhyme with 'wind' and 'birch': Carrier Ci, Hag. Ci (where C is plain stop or sonorant), Cəy elsewhere. See the forms listed in 2.2.

Sapir had clearly considered this problem, as may be seen from Newman's class notes from April 8, 1936: "The i vowels are rare; some evidence of this vowel as contraction of -yĕ-, -ĕy-...Perhaps pre-Ath had only 2 vowels--a and ĕ. In Ath. a, e˙, e are most common. No phonemic diphthongs in Ath., which has only Vy 'diphthongs'." The notes also show that Sapir derived his *o (our *ʊ) in many cases from ə, e.g. /q^{w}__ or /__x^{w}, but the bold statement about only two vowels, casting doubt even on pre-PA *e˙, shows that Sapir's thinking went much further.

Finally, in the same way that we must consider the relations əy:i˙, əw:u˙, we must also consider əŋ̲:i̯˙:i˙n,

əm:u̯ˑ:uˑn, especially before ʼ. We have already seen suggestions of such relations above, as for 'mouse', 'roe', in 3.2, and now probably also in those forms listed with final -ŋ̲ʼ and apical initial, 'stingy', 'flesh', 'handle', 'bow', 'dog', where distinctions between reflexes of *Təŋ̲ʼ and *Tiˑnʼ ([Təỹʼ] and [Tɨˑʼ]) are very unclear (2.2).

Certainly this question of the relationships əy:iˑ, əw:uˑ (and əŋ̲:iˑn, əm:uˑn) requires further investigation.

6.0 Stems with internal sonorant

There are several types of stems with internal sonorants, of the form *CVRV(C) (disyllabic), or *CVRX (monosyllabic). Any full presentation of the complexities that we are already aware of in the development of sonorants in the stems of these languages must at least broach this subject, which we are only beginning to understand. We shall first (6.1) discuss what we have been calling Eyak "broken stems", disyllabic sonorant-medial, both open, of the form CVRV{ʼ h}, and obstruent-closed, CVRV(h)X, fairly abundant in Eyak. We shall then (6.2) document a number of disyllabic sonorant-medial stems for PA, of the form *CVRəX, and next (6.3) PA disyllabic stems with medial (voiced) fricative, *CVZəX, which contrast with monosyllabic *CVSX, to provide a contrast, *CVXəX with *CVXX, parallel to that of *CVRəX with *CVRX, finally examined in 6.4.

6.1 Eyak Broken Stems

Eyak has in fact about 75 "broken" stems, in a considerable variety of shapes. Included in this number are about 45 of the shape CVRV{ʔ h}, not clearly attested as such in Athabaskan. A number have monosyllabic cognates in Athabaskan, and/or monosyllabic allomorphs (here joined by ~ where regular within a paradigm) or related stems in Eyak (here joined by comma): e.g. -dəleh 'horn' (PA *-de', uncertain cognate); -c'əlih 'bone', non-possessed c'əl, archaically c'əlih (PA *c'ən, *-c'ənə'); -x̣u̯'-ł-ƛ'əla' 'gums' (-ƛ'i 'bind', PPA *-ƛ'i'w, PA *-ƛ'u); -siyu- ~-su- 'kill pl.'; -šiyah ~-šah ~-ša'- 'bad' (adj.), -šah ~-ša'- 'stingy' (verb; cf. perhaps PA *-čən̲' 'stingy, bad'); -gəwih ~-gəwi'- ~ -gəw- 'feel', -gəmih ~-gəmi'- ~-gəm- 'taste' (cf. -gah ~-ga'- ~-ga'- 'know'); -kəmah, -ku̯'- ~-ku'l- 'belly, base' (PA *-k̲a'n, -k̲ən; but cf. also Eyak dəkɨh 'stick', PA *də-k̲ən); k'əyɨ'y, k'ɨh- 'strange, other' (v.Addenda); ɢəma' 'maggots' (PA *ɢu'n); -ɢəla' 'shoulder' (perhaps PA *-ɢə'nə' 'arm'); -q'əma' 'kidney, roe' (cf. -q'u' 'spawn'; PA *q'u'n' 'roe'); x̣əwa' 'dog', -x̣əmah, -x̣ah 'growl' (PA *-ɣ̣^{w}ən, etc., PAE **-x̣^{w}an or **-x̣am); -x̣əwih~-x̣əwi'~~-x̣əw- 'believe, agree with, be lucky' (cf. o-x̣əw 'simultaneous with, even with o'; preverb x̣u' 'right, complete'). Such Eyak stems are thus closely related to open (or sonorant-closed) stems of the form CV(R)(') in Eyak and Athabaskan. The complex correspondences in these are beyond the scope of this paper (and our present understanding) to explain adequately here. There are several more such Eyak stems with monosyllabic

cognates or variants, but still more numerous are those with no obvious PA cognates or related monosyllabic Eyak stems, e.g. giyah 'water', ƛ'e'yu' 'hemlock', łila'ˀ, łəni'ˀ- 'man, boy', c'iyuh 'black bear', čiyah 'dentalium', č'i'leh 'Raven', k'əmah 'sea lion', q'əyɬ'y 'fog'; the preverbs qəla', qəyuh, qənuh, 'beating up', 'belligerently', and 'openly', respectively.

A somewhat smaller number of Eyak broken stems, about 30, are obstruent-closed, CVRVX. Of these, perhaps half show no clear Athabaskan cognates or related Eyak monosyllabic stems, e.g. ʒəwəł 'gillnet', -c'iya'c' 'putrefy', ʒilahɢ 'brain, camass root', -giyił 'hex', kəwəs-g 'canoe paddle', -ɢəmək' 'round', q'əla'k' 'shirt', and two items with canonic stem-final obstruent clusters as well as medial sonorant (the most complex of canonic Eyak stem shapes), -qəməχc' '(top) spins; stare' and qəməχč' 'rotten spot on ice' (but cf. conceivably k'u-ł-quhχč'-ł 'lamp chimney', with no analysis of meaning). The other half show related monosyllabic stems in Athabaskan and/or Eyak: e.g. c'iyux 'mosquito' (perhaps also c'u'x 'barnacle; philtrum'; PA *c'u'y(ə) (etc.; v.Addenda) 'mosquito'); -siyəq'~ -siya'q'~ -sa'q' 'belch' (cf. Nav. -zé'h~ -zą'; PA *-ze'q'~ -zą́q'); č'iyahd 'hat' (PA *č'əχd, see 6.3.1); č'iya'ƛ'ɢ 'frog' (see 6.3.2); -č'iya'k' 'smart, sting' (PA *-č'i'k'); kəna's 'wolverine' (see 6.4); -k'əwahʒ 'nail' (PA *-č'ˌʷəʒʷ or *-č'ˌʷʔəč'ˌʷ, Tna. -ç'əş, Ing. -ç'əʒ, etc.); χəla'g 'winter' (ł-χəla'g 'become winter'; PA *χɑy; a highly complex correspondence); -χəwəχ 'man's older brother' (PA *-(h)u(')nəɣə, Tlingit hunχ, see 7.5). Of special interest

are -ɢəməc' -ɢəc' 'twist, wring' (practically synonymous; also perhaps ɢəc' 'dry salmon type', ɢe'c' 'spruce roots'; PA *-ɢe'c' ~-ɢəc' 'wring', *-ɢe'c' 'roots, twisted wood', *ɢe's 'king salmon'), and -x̣əwa's, -x̣a's 'itch' (allomorphs largely overlapping in free variation, but -x̣əwa's preferred with repetitive, -x̣a's preferred in neuter and active imperfectives, durative or persistive; relationship unique and unclear); also x̣əs 'pus', -x̣e's 'infected' (PA *x̣əz 'pus', *-ɣ̣e'z 'itch').

In the ca. 70 Eyak broken stems (obstruent-closed or not) fairly certain to be monomorphematic in origin, there are some dominant patterns. In almost all the sonorant is preceded by ə (i before y) in the first syllable. However, following the sonorant in the second syllable is a considerable variety of vowels, correlating only very partially with the sonorant; approximate figures: after w or m, 13 stems have a, 3 have i, 9 have əX, and none have u or e; after l or n 11 have a, 3 have i, 2 have u, perhaps 4 have e, and none have əX; after y 13 have a, 6 have u, 4 have əX, 2 have -i̯'y, perhaps 1 has e, and none have i (full, as distinct from ə). It appears significant that over half (37) of these stems have a following the sonorant, i and u are of much lower frequency (5 and 8 stems respectively), e is rare and uncertain, and absent are i after y, and u after w or m. (The absence of -əX after l or n is explained by the late historical rule *Vn›Ɣ'/__(ə)X; v. 7.2.2, especially p. 129.)

There seems to be some correlation also between stem-initial obstruent and choice of sonorant. Of stems with t-, ƛ-, or c- series initial, only 3% (one of 120, 3 of 62, and 6

of 135 stems, respectively) are disyllabic, whereas of stems with č-, k-, and q- series initial, 11% (14 of 106, 15 of 160, and 29 of 259 stems, respectively) are disyllabic. The only t-series initial that is with any probability a broken stem is -dəleh 'horn' (if cognate with PA *-de'); the three most probable ƛ-series initials all have -l-; and c-initial disyllabics are with -w- in one case, -l- in two, and -y- in five. For the initial series with higher frequency of disyllabic stems, č- has -y- in 10 cases, -l-/-n- in three, and m in one only, whereas for the k- and q- series (< PAE *k- and *k^w-, *q- and *q^w-), -w-/-m- occurs much more frequently: with k-, 9 cases of -w-/-m-, one of n, 5 of -y-; with q-, 15 cases of -w-/-m-, 9 of -l-/-n-, and 5 of -y-. There appear to be no original disyllabic stems beginning with ∅ or ' at all (not counting exclamations, e.g. 'əyąh 'poor thing!', various other types, e.g. 'ənuh 'child's penis', 'ənahšəkih 'pleasant', all of which may be considered marginally canonic, or to have 'ə- prefix; but no ordinary noun or verb stems). See 7.3.1.2 (end) for further discussion of Eyak internal sonorants in relation to stem-initials.

Where there are alternants within Eyak, in about half of the cases the monosyllable takes the second vowel, e.g. -siyu-/-su-, -šiyah/-ša, -xəma/-xa, -x̣əwa's/-x̣a's. However, there are cases especially with w or m such as -x̣əwi-/x̣u', -q'əma'/-q'u', -ɢəməc'/-ɢəc' (and ɢe'c'), and also -č'əlih/-č'ą'- 'forearm', in which the monosyllable does not have the second vowel. One might nevertheless be tempted to posit

PAE CRV(C) for these forms, in view of all but the last evidence. However, though this might have some partial truth for pre-Eyak, the correspondences with Athabaskan are far too complex to be interpreted as bearing this out for PAE or PA: We shall cite only a few of the Eyak-PA comparisons which point away from this hypothesis: č'iya'k': *-č'i'x̲', kəna's: *-č^{w}ɬ's or the like, -k'əwahʒ: *-č'^{w}əʒ^{w} or the like, ɢəma':*ɢu'n, q'əma': *q'u'n'. However, since beyond the most elementary and direct correspondences, even the simpler details of comparative Athabaskan-Eyak phonology (some of the obstruents, obstruent clusters, postvocalic h, ', ', much of the vowels) still remain to be worked out, it is appropriate that we are not yet in a position to deal confidently with these medial sonorants. Yet clearly they must figure importantly in an eventually improved understanding of the phonological history of these languages. One observation, however, that can already be made, is that ironically and significantly, none of the Eyak disyllabic stems have disyllabic cognates in Athabaskan, and as we shall see below, for none of the Athabaskan disyllabic stems do we have attested disyllabic cognates in Eyak.

6.2 Athabaskan stems of the form *CVRəX

We shall now turn to disyllabic stems in Athabaskan, first especially those with medial sonorant (similar in some respects to those with medial voiced fricative). The Athabaskan language with by far the largest number of such

stems documented is again Ingalik. We shall here list most[26] of them, with Athabaskan and/or Eyak cognates, often quite problematic. Note that these are all of the form CəŋəX or CəməX in Ingalik.

1. Ing. -gəŋəṣ̌ 'tickle': Koy. -gʷs 'tickle', Tni. -gəč', Han -ɣǫ̀r; perhaps Eyak -guč' 'penis', perhaps also -gu'š 'squint, grimace'; cf. also Chip. -ɣuž, Sek. -ɣu'že', Tol. ɣuš, Gal. -ɣoš, Nav. -ɣó'ž 'vagina', -ɣàs-cò' 'clitoris', perhaps also Car. -ɣas 'spawn (of male)';< *-g̲əməč' ~-g̲əmə̀š(ʷ), etc., therefore probably also At. -bac'~-ba'c' 'tickle', where -g̲- + labiality > b?.
2. Ing. -ɣ̣əŋəʌ 'bail': Hol. -zəŋəł, -zənəł, Koy. -zəɣəʌ, -ził, Chip. -zel 'pour liquid', Nav. -žǫ̀ł 'drizzle', perhaps also -žǫ'l 'chaff, dust'.
3. Ing. ṣ̌əŋəʌ 'moss': Koy. səməʌ- (Jetté only), səbəʌ-, -zəɣəʌ (Lower dialect only, elsewhere -zəx̣ʌə), Tni. nan šnəʌ' 'swamp moss', Kut. nɬą'ṣ̌il 'puffed moss'; also 'wick': Hol. -zənəł; perhaps diffusions except Kut.
4. Ing. -dəŋəʌ 'curly; cone of conifer': Koy. (L) -dəɣəx̲ʌ; probably At. -lak'-du'y, Tni. -lu-diya 'spruce cone', perhaps < *-dəməɣ-(ł); cf. further Tnc. -láh-ɣó-l'', UT -lə̀h-ɣǫ'l' 'spruce cone', nɬl-ɣik 'curly', Han -lə̀h-ɣə̀' 'spruce cone'. (V., however, Addenda.)

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26. We have here excluded e.g. θ̂ədaŋəθ 'night', cf. Koy. ʌədə 'night'; probably < *təʌə 'last night', < *tə̀c' 'night', + *-ŋ̲əs 'long'; cf. also Koy. ʌədəx̣ɑnəł, Ing. θədənəŋaθ 'all night long'.

5. Ing. q'əŋəʎ 'birch cambium': UT k'i̯'ł, At. (Mentasta) k'i'ł; Car. k'ənih, Hag. q'ənəx̲, Han k'ə̀n', Tahl. k'in (Thorman), Sek. k'ənih (Young, 'sap-bark'), k'ənih (Morice, 'sə̀ve (avec le cambium)'), clearly < *q'ənəx̲-ł.
6. Ing. θ̂'əŋəθ 'overflow and freeze': At. c'enes (in place names), Chip. -θ̂'ɛθ 'glacier is formed' (cf. Legoff θ'ɛðì tthə̀zhì 'glaces se formant d'eau qui sort de terre, glacier'), perhaps also Koy. -ʎ'i'ʎ 'thin ice, frost'.
7. Ing. -ɮəŋəθ 'deep; slow dance' (no clear cognates)
8. Ing. łəŋəθ 'dwarf birch': Hol. łəŋəθ, Koy. łəyəł, At. łyes, Tni. 'əłyəs, UK łiyəs, Tna. łəyəθ, Tnc. łu'ə̆', UT łi̯ǫh, Tu. łruan, ʎruan; Tlingit łe^yis.
9. Ing. θ̂əŋəł '(stone) axe': see 2.1.1.
10. Ing. təŋəł 'vessel': see 2.1.1.
11. *nə-čə̲ŋəł 'flicker' (not attested in Ingalik): see 2.1.1.
12. *x̣əŋə̂s 'raft' (not attested in Ingalik):

    Koy. xʊɣʊł, At. h(w)nes, Tni. x̣ənəs, UK x̣ənəs̲, Tna. x̣ənəθ, Han xə̨', Kut. xə̨h, UT xi̯ą̣h, Tnc. xi̯'θ, NTu. x^wán, Bvr. xʌnʌs (Story), Tahl. kines´ (Thorman), Sek. xənəs (Morice), Hare xene, Hag. wəyəs, Car. xinyəs, Chil. xənə́s̲, Gal. kalas, -kalas'e ('boat, canoe'), Mat. kxé'nis, Sar. kanis ('canoe'), ChC. xɑnɑθ, Tut. xənəs ('canoe', Golla), Tol. xenəs; Tlingit x̣a^nas'. Partly diffusion.

13. PA *dənəx̣ 'Arctostaphylos (bearberry, kinnikinnick, manzanita)' (not attested in Ingalik): Koy. dənəx̣, UK dənəš, At. denes, Tni. (Upper Inlet) dnes, Tnc. dəndəy, UT dinay, Han ndey, Hut dandaih, Hag. dənəx̣, Car. dənih, Chil. dənəš [dənəx̣], Tol. dənəš, Hupa dənəW (Curtis), Lassik tenís (Essene), Wailaki dénəs (Curtis), Kato dnəš (Curtis), WAp. dinos; Tlingit tinx.

14. PPA *-həwəs < *-hu's (never reduced) 'pull, stretch', also -d-u's 'crawl', -l-u's 'drag': see 6.4.

15. Ing. c'əməʌ 'hammock swing': Hol. c'əməʌ, Koy. (Lower) c'əməł, c'əɣəx̣ʌ, (Central) c'ił; At. benes, -bi'zi (verb -bi's, -bi'c'), Tni. (verb) -bic', UK mis, Tna. c'ibiθ, Tnc. -dahmbí'ł, UT -dahbił, Han -dahmèn', Kut. -vał, NTu. demyán', Hare bahbílí', Brlk. dahbelí', Chip. hubił (Legoff), Tahl. debele (Morice), Sek. -bəł (verb, Morice), Car. -bał-, Chil. tabəł. Second syllable in some languages perhaps < *-wi's(-ł), *-wəsł, *-wi̯'s- < *-wəns- or *-wənəs-?, blended with or replaced by *-wi̯'ł < *wən'-ł 'snare', and/or *-wå'ł 'hang suspended'; in any case related to second syllable only of Ingalik-Holikachuk-Koyukon form, itself partly a diffusion; in Koy. *-s-g̣ > *-s-x̣ > *-ł-x̣ > *-x̣-ł > -x̣ʌ.

16. Ing. -gəməθ 'round': Hol. -(gə)məθ, Koy. -bəł, At. -ba's; -bą's~ etc., found in virtually all Athabaskan, 'round, roll', -məθ in Ingalik reduced variant, and -gə- probably gə- (< *k̲'ə-) 'indefinite'. See Addenda.

17. Ing. -č'əməg 'plunk': Tni. -ɣ̓əməq', but also -məq', and k'əməq' 'spawning pool', together with many other Tanaina onomatopoetic and nursery terms with -m, e.g. ʌ'ət', ʌ'əm 'fart'; see 3.2.

The last three stems suggest that Ingalik medial -m- stems are of a secondary type, wherein the second syllable corresponds to well-known stems in Athabaskan elsewhere, and the first may be a prefix incorporated into the stem. (V., however, Addenda.) These are distinct from those with medial -ŋ-, 1.-8., none of which are analyzable, with unanalyzable cognates, often monosyllabic, in other languages (although here too there is the possibility that these originated as compounds). In the absence of Ingalik disyllables with medial -n-, -y-, or -v-, it appears that Ingalik medial -ŋ- represents a generalization of all possible medial sonorants. From the vowels in the cognates it is clear that the medial was *m or *w, at least in 1., perhaps also in 2. and 4. In 5. it was *n; in 8. it was probably *y; and in 9., 10., and 11. it was certainly *$\underline{ŋ}_2$, as these are cases of widely lexicalized but historically analyzable forms, with the stems *$\underline{ŋ}_2$əɬ 'wedge' and 'pour'. Unfortunately 12. and 13. are not attested in Ingalik. The correspondences are of course exceedingly complex and/or irregular, the number of forms few and susceptible to reinterpretation to differing degrees; dənə$\underline{x}$, for example, is never *dɬ'$\underline{x}$, probably because of the great frequency of prefixes like də- and stems like -nə$\underline{x}$.

It is uncertain to what degree we may ever approach rigorous PA reconstructions for some of these forms.

One correspondence which can be repeatedly observed, however, is Koyukon medial -ɣ- instead of sonorant (in 2., 3., 4., 12., 15.), perhaps in part a simple denasalization of *-n̲- (in a language where also n and y are now more closely associated with the obstruent system, e.g. by participating in devoicing in absolute final position). The resulting forms, CəɣəX, thus join those of a different source, the half-dozen or so widely attested stems of the type Koy. cvɣvɬ 'merganser', < *č^{w}əɣ^{w}əs(ɬ), shown in 6.3.2 below.

6.3 *CVXX and *CVXəX stems

A central issue in the discussion of broken stems is whether there existed stems of the form PPA *CVCX as distinct from *CVCəX. As far as we can tell from the limited evidence, it appears that such was indeed the case in Athabaskan. In order to demonstrate this, we shall consider first the case of PPA *CVXX as opposed to the *CVXəX stems, and second the case of *CVRX as opposed to *CVRəX stems. In both instances, we propose to show that for *CVCX stems there is a tendency for the first postvocalic consonant to fuse with the vowel or disappear leaving only traces of its former existence, whereas *CVCəX stems either remain disyllabic in PA, or retain evidence of having been disyllabic.

Considering first the PPA *CVXX vs. *CVXəX opposition, we may note that, in both cases, the first postvocalic

segment is invariably reconstructible as a fricative. By the time of PA, intervocalic fricatives had become voiced; thus the opposition in PA is seen as *CVSX vs. *CVZəX.

6.3.1 *CVXX stems

To illustrate *CVXX stems, we shall begin with a handful of interesting noun and verb stems reconstructed with the cluster *xd.

PA *č'əxd 'hat': Tni. č'əx (archaic), Ing., Koy., Tna. c'əx, Han c'æd, Kut. c'eh, NTu. (Mayo) c'a', c'a't, STu. c'a't, Sl. -c'ádé, Tag. -c'ahdɛ' (McRoy, Golla), Tahl. c'əx, -c'əxe' (Morice), tsah'a, tsa'a (Thorman), Tset. c'aká, Sek. c'áh, -c'áhe', Bvr. -c'ahdé, c'at, Car. c'oh, Tut. -c'ad, Coq. tṣ'ɑht (Harrington), Tol. -trát (Curtis), Hupa -c'ad 'wear hat', c'ah- 'hat' (Sapir), BR, Mat. č'ah, Wail. -chit (Curtis), Nav., Ap. č'àh; Eyak č'iyahd. Cf. Tlingit s'a'x^{w}.

PA *yəxd 'house': Koy., Ing., Tna. yəx, Kut. žeh, Han žoh, Tag. -ɣid (< -xid probably < Tlingit hid), Tag. dəts'ít, -tsidɛ' (< *dəkən-hid) (Golla), NTu. žat, Chip. yɛ, Car. yoh, Sar. -ɣa, Mat. -yih, -yid ('build house'), BR yit, Wail. yĭt (Curtis), Kato -yīt ('build house'); Eyak yahd; Tlingit hid.

PPA *-'əxd 'move fabric abruptly' (perf./mom.IO): PA *-'ɑxd/'a'd; Ing. -'ʊx/'od, Koy.-'ɑx~'ɑd/'od (cont. -'ɑd), Car. -'əx/'ad, Nav. -'àh/'á'd (semel. and seriative -'àd); At. -'ad/'a'd, Tni. -'əd/'ud, Chip. -'àr/'ar, Sar. -'ð'/'ó'; Tl. -'ax 'classificatory, fabric'.

PPA *-ʎəx̣d 'jump up; flare up (of fire)' (perf./mom. IO): PA *-ʎəx̣(^{w})d/ʎa'd; Ing. -ʎʊx̣/ʎod, Koy. -ʎəx̣/ʎod (cont. - ʎʊx), Kut. -ʎe'/ʎid, Car. -ʎəx/ʎad (cont., plur. - ʎəx), Nav. -ʎą̀h/ʎá'd (Sapir-Hoijer, Haile, but Young and Morgan contrast -ʎą̀ 'catch fire, become overwrought' with -ʎą̀h 'stop'); At. -ʌed/ʌa'd, Tni. -ʌəd/ʌud; Eyak -ʎe'x̣ '(fish) flops'; cf. Tl. -ʎex̣^{w} 'scare (fish) by plunging pole in water'.

Note the aspiration recorded before the d in the Tagish and Beaver words for 'hat', which is especially impressive in the case of Tagish as it was transcribed by two independent observers. Note also that the reflex of final *x̣ is more common with noun stems than that of final *d, as with the perfective stem of the verb. In the other verb stems, however, the final consonant is invariably the reflex of *d. It is significant that wherever the final *d is retained in the reflex of 'hat', the stem vowel is the reflex of *ɑ or *a and not of *ə; compare for example the Han reflexes of these two items. This strongly suggests that the openness feature of *x̣ was absorbed in the vowel, so that its uvularity was, so to speak, supra-segmentalized in a manner similar to that described above in 5.0 for other postvocalic segments.

Other items ending in clusters of which the first member is (with more or less certainty) reconstructible as *x̣ show the same association of the vowel *a with the disappearance of the uvular.

PPA *yəx̣s 'snow': At. ya's, Tni. yus, Ing. yəθ, Koy. yoł, UK yoǫ, Tna. yoθ, Tnc. žaθ, UT žih, Han, Kut. žah, NTu. ža, Tag. zas (Golla), Tahl. yas, zas, Tset. ɣɔ, Chip. yaθ, Sek., Bvr. yas, Car. yəǫ, Chil. yəŝ, Sar. zàs, K-T [yəxs] (in eight transcriptions by six transcribers), Coquille yâhs (Harrington, "says that mere yâs not correct"), Gal. yas, BR yɑs, Mat., Hupa yas, Kato ya'ʿs (Sapir), Nav. yàs, zàs, Ap. zàs.

PPA *-k^{w}əx̣s 'whip' (pf./mom. IO): At. -ces/ca'ʿs ('choke with line'), Ing. -čọθ/čọθ, Koy. -cvł/coł (semel. -cvł, seriative -cvʌ), Kut. -čị'/čị', Car. -cəǫ/caǫ (cont., plur. -cʊs), Chip. -θ̂aθ/θ̂aθ, Sar. -cos/cós (-císd 'make whizzing sound', -císdí 'make crackling sound (of whip)'), Nav. -càs/cá'ʿs (fut., rep., and semel. -cìs; cont. -càs); Hupa -cas.

Of special note for 'snow' is the Kwalhioqua-Tlatskanai which shows this cluster overtly, as do perhaps less obviously the Coquille and Kato. 'Whip' presents a very interesting range of stem forms. In the first place, the voiceless final fricative in the perfective stem points to the fact that the root ended in a cluster; thus this was first reconstructed by Leer as *-k^{w}əsd (Leer 1979.84). However, the puzzling alternation of the reduced stem vowel in Sarcee and Navajo (*ə in the perfective stem, *ɑ in suffixed stems) points toward a reconstruction PPA *-k^{w}əx̣s. If we assume this reconstruction, it follows that in the PA perfective stem *-č^{w}əx̣s > *-č^{w}ɑs, but in obstruent-suffixed stems the cluster was reduced by deletion

(not absorption) of the *x̣: *-c^{w}əx̣s-X > *-č^{w}əs-X, resulting in a final cluster of only two consonants. This seems to imply an important principle in development of PA from PPA, that clusters of two obstruents (e.g. *-x̣s, *-sł) were canonic in PA, but no longer three (e.g. **-x̣sł). Leer had noted (1979.85) that there was only one obstruent suffix position, but the application of this two-obstruent limit for clusters is now extended to include stems with integral final clusters.

There may be a number of other roots or stems which originally ended in a cluster (which was an integral part of the stem), but where the evidence of this cluster is only marginally found in PA, or not at all; so that Eyak may provide the only evidence.

*łəšč'^{w} 'plank': K-T klush-ts (Gibbs), łî'ztz (Teit) [łəsʒ], Tut. łəs, Tol. łe'ş̣, Hupa łəsč', Tna. -də-ləş̣ 'planking in canoe', Car. łəs 'piece of firewood', Koy. łəs 'slat', Kut. łiş̣ ʒig 'kindling'; Eyak łe'sk'.

*we'š(^{w}) 'knife': Tna. -baš, Chip. bɛs, -bɛzé, Nav., Ap. bé'š, -bé'ž, well known throughout Athabaskan (see 1.1); Eyak we'gš-g; Yakutat Tlingit wé'gš.

*-ɣ̣^{w}əǯ 'tickle': Hare -ɣo (Petitot), Chip. -ɣoš (Petitot), Car. -wəs, Sar. -ɣùš, Gal. -gaš ('tease, annoy'), Nav. -ɣǒž; Eyak -x̣a'x̣č'-x̣.

There are doubtless more such stems, corresponding to the many Eyak stems of the form CVXX.

6.3.2 *CVXəX stems contrasted with *CVXX

Stems reconstructible as PPA *CVSVX > PA *CVZVX are in some ways more obvious and easier to reconstruct:

*t'əɣəs 'cottonwood': At. t'aɣes, Tni. t'əɣəs, Ing., Hol., Tna. t'əɣəθ, Koy. t'əɣał, UK t'əɣəʂ, Tnc. t'a'θ, UT t'ĭ'h, Han t'əh, Kut. t'a', t'aw (Petitot), NTu. t'o, Hare, Brlk. t'ewi Chip. t'aðɛ (Petitot, Legoff), Hag., Car. t'əɣəs, Chil. t'aŝ, Gal. t'a's, Tol. t'aɣəs, Ump. t'əɣəs (Hale), Kato chqhŭs-cho (Curtis), Wail. t!ŭ-ghus (Curtis), Nav. t'ì's; Eyak t'əχs (one old speaker), t'əχgs-g (younger speakers). The Eyak is definitely a diffusion from Athabaskan, as -χs and -χgs are not canonic Eyak stem-final clusters, the latter being an approach to -gs-g, which is.

*ƛ'əɣəš(ʷ) 'eel, leech, snake': At. ƛ'aɣes, Tni. ƛ'əɣəš, Ing. ƛ'əɣəs-, Koy. ƛ'əɣəs, UK, Tna. ƛ'əɣəʂ, Tnc. ƛ'a's, UT ƛ'ĭ'h, Han ƛ'oh, Kut. ƛ'ah, ƛ'ąh, Hag., Car. ƛ'əɣəs, Chil. ƛ'aɣəs-, Nav. ƛ'ì'š; Tol. targhus (Curtis), Tut. ƛ'əɣəš, Gal. ƛ'a'š, Ump. ʊɣáçtço (Hale, supply ƛ'-), Hupa ƛ'ə(wə)W, Mat. t'łiɣic, Kato tlghŭsh (Curtis), Nav., Ap. ƛ'ì'š. Cf. Tlingit ƛ'uk'ʷχʷ 'worm' (< *ƛ'əχk'ʷ ?).

*č̣ʷəɣ̣ʷəs(ł) 'merganser, etc.': Ing., Tna. č̣əɣʊθ, Koy. cvɣʊł, UK ç̣əɣʊʂ̣, Hol. cəɣʊθ, Tni. čəɣəš, At. ceɣos, Tnc. ca'θ, UT co'ł, Kut. č̣ah, č̣ąh, Han wəč̣aw, Hare (k)fole, Chip. probably ĥoθ (Petitot thosh, Höhn toth, Legoff shosh (sh=θ)), Tahl. tsôś (Morice). Cf. Tlingit ča'χ 'grebe'.

*-ǯəɣ̣əd (or *-ǯəɣ̣ət') 'tickle': Tna. -ʒəɣəd, Tnc. -ʒa'd.

*-ɮəɣ̣ʷəʌ' 'round, ball, play (catch)': Tni. -ɮəɣəʌ' 'play catch; fungus', Koy. -ʒʊɣʊʌ 'play'; cf. also Koy. -ʒʊɣʊɬ-kən 'nape of neck', and (Lower) di-ki-ɬ-ʒəɣəɬ 'arctic tern' (-ki- 'tail'). (V. addenda.)

*-ləg̲ 'squirrel', perhaps onomatopoetic, in four major types: (1a) reflecting *cələx̲ (< *ce'- 'rock'): At. celes, Koy. ʌələx̲, Tna. θələx̲, Tnc. θɛl', UT θi'l', Han θaw', Kut. θah, θa', STu. θal, Tut. sŭ-lŭs (Curtis), Tol. seləs, Gal. salas, Hupa sĭ-lĭs (Curtis), sələW- (Parsons, 'chipmunk'), Lassik slŭs (Essene), Wail. sĭ-lŭs (Curtis), Kato slŭs (Essene, Curtis), Mat. tcxalis (by metathesis); (1b) reflecting *čələx̲: NTu. caw, Tag., Tahl. čəli (Thorman), Slave cele; (1c) reflecting *ca'-ləg̲: Hag., Car. caləg (Morice < "beaver-dog", but probably "rock-squirrel" with ca'-variant 'rock', cf. Eyak ca' 'rock' and Ing. coʌəg', caʌəg' below); (1d) Ing. (Kuskokwim) tələ, (Yukon) təlәy, Hol. təlәx̲; (2) reflecting *cVlG̲uɮ- (where *G̲ is *g̲, *ɢ, or *q) 'chipmunk', related to or blended with the preceding: Chip. θolgúzi (Young), θeɬolguze (Legoff), Sek. colʒus (Young), Hag., Car. colɮəs, Coquille sɑlgɑ́sdʒæ (Harrington), Hupa sə́ləxoség(e) (Parsons), Kato tsiltcŭntc (Essene), WAp. céskosi; (3a) reflecting *də-ləg̲ə or -lə̀k̲'ə, most commonly > *ʌəg̲ə or *ʌək̲'ə 'tree squirrel', but with variants, as in At. ʌigi, Tni. ləga, c'əlga, UK dəlɮa, Koy., Tna., Tnc. ʌəgə, UT ʌagn, Han ʌey', Kut. ʌag, NTu. ʌág, STu. ʌra, Tag. ʌə́ʒə, Kas. ʌoɮe (Petitot), Chip. ʌíyɛ, Bvr. -ʌih, -ʌehę', -ʌʌyeh, -ʌé' (Story, Young), Hare ʌi̯yę, Brlk. ʌía, Tset. ʌiya,

Sl. ʌo˙, ʌoye (Petitot), Chil. ʌəg, Hupa łigé (Parsons), Lassik łitco (Essene), Wailaki łḵí-cho (Curtis); (3b) with *ca˙- and *ce˙- variants of 'stone' in Ing. (Yukon) coʌəg˙, (Kuskokwim) caʌəg˙; (4) diffusions from variant of type (1) *cələg̲ or *cəlɬ̓k' < *ce˙-ləg̲ or -lɬ̓k': Eyak cəłk', Tlingit całg, further also Haida tco´lqî (Skidegate, Swanton 1911.274), and Tsimshian (Nass-Gitksan) c'ənłɬ̓k' (Rigsby 1967.34, where -łək' is considered a loan from Athabaskan, c'ən- not identified), Gitksan ts'in hlik (Thistle-Walker 1977).

Clearly, these ramified developments are all based on a single PA stem *-ləg̲ or *-lɬ̓k', including a widespread disyllable *cələx̲, *cələg̲, or *cəlɬ̓k', with monosyllabic diffusions into Eyak and Tlingit, cəłk' and całg. On the basis of forms such as these, and Eyak t'əx̲(g)s, Krauss had been earlier led to believe (1964.127) that they were originally monosyllabic and that Athabaskan developed epenthetic ə, **CVXX > *CVXəX, but it is now clear that the reverse is the case.

We shall now make note of three problematical stems (which might be from either *CVXX or *CVXəX) for which reconstructions will not be attempted:

'brown bear': Hupa /sa˙c'/, not *[sa˙c'], thus underlyingly /sawəc'/ (cf. 'eye', 3.1), Gal. sa˙s, ChC. s̲əɣəs (Harrington), θʌɣʌ́ɬ (Sapir), Car. šaz̲, Babine čas, Hag. x̲as, Tset. x̲ɔ, Han, Kut. ših, variously reflecting PA

PA *x̲...c', *x̲...s, with internal velar fricative, stem-initial often s-, assimilated to final. Forms also affected by other 'bear' stem, *x̲əš(ʷ).

'alder': virtually all Athabaskan (including PCA) reflecting *q'əš(ʷ), but Mat. k'i̲ɣi̲x; Nav. k'ÎŠ (usual), but also k'Î˙š- (Young and Morgan 1980), k'í˙š (Hoijer 1974).

'frog': Chip. c'aiłi (Legoff, Young) < *c'ałx̲i, c'ale (Petitot), -c'ál (Li), Hare c'ale, poss. -c'álé (Li), c'ale, c'ále (Rice), NTu. c'à˙, c'à˙d, STu. c'ál, Tset. c'alé, Tag. č'á'lɛ̀ (Golla, who contrasts this with č'á'lɛ̀ 'spoon') Chil. č'əł (Morice), Hupa /č'ʷahl, č'ahl/, BR tc'a'ac, Kato tcahą̨l, Nav. č'àł; Eyak č'iya'ʎ'ɢ.

Hupa l-čəq' 'jump (of a frog)' suggests that 'frog' is derived from č'əq' with -ł suffix. However, the Eyak leaves us in doubt here; moreover, the reflexes of this form fail to rhyme with those of *šʷəx̣ł 'hook' < *šəq'-ł:

*šʷəx̣-ł 'hook': Kut. ṣą̨h (< *šʷəł), Han ṣąw (< *šʷəł), Koy. səx̣ʎ, Ing. -ẓəɣ, Tni. (Outer Inlet) šəx̣i, At. sax̣i 'gaff hook', Tna. ṣəx̣, Tnc. sax, səł, Tahl. šəł (Thorman), seł, -zełe (Morice), Sl. seh, Brlk. gohzé, Chip. sáł, Bvr. sęł, Hag. səx̣, Car. soh, Chil. səx (Morice), Tol. shahl (Curtis); for the verb root cf. Chip. -zɛ́/záɣ, Nav. -žé˙/žà' (impf./perf.). Cf. Eyak če'q'-ł, -če'q' 'hook O'.

'Hook' is but one of many examples of PA noun stems of the form *CVX-X which could be added to the list above of those of the form *CVXX in which the cluster is integral to the stem. *CVX-X nouns (common especially with -ɬ instrumental suffix) and *CVXX appear to develop alike, monosyllabic in all languages, as do literally countless verb stems from PA *CVX-X (e.g. with repetitive, progressive, or other obstruent suffixes, see Leer 1979, Kari 1979). These all contrast sharply with the reflexes of PA *CVXəX (*CVZəX), as e.g. in the development of *t'əɣ̣əs 'cottonwood'; their diffused forms, as in Eyak t'əx̣s, or Tlingit całg 'squirrel', have proven misleading.

The monosyllabic Tlingit forms for 'bearberry' tinx and 'older brother' hunx̣^{w}, as compared to PA *dənəx̣, PA *-(h)u(·)nəɣ̣ə Eyak -x̣əwəx̣, prove to be misleading in the same way for PA disyllabic sonorant-medial stems, *CVRəX, which clearly have to be distinguished from *CVRX, as will be shown below.

6.4 *CVRəX stems contrasted with *CVRX and the problem of stem-internal nasalization

The most difficult PA sonorant problem remaining is the reconstruction of stems with medial sonorant, both in determining whether the stem was disyllabic, and in determining which sonorant was present, or in some cases if any was present. Considering first the non-nasal sonorants, we have already seen (5.3) that postvocalic PPA *y and *w blended with preceding *ə or *ɑ, resulting in full vowels: *əy>i·, *əw>u·,

*ɑy > e', *ɑw > a'. Thus, although there may well have existed PPA stems of the form *CVy(ə)X and *CVw(ə)X, these had already become monosyllabies by PA. In a few cases they may be reconstructed for PPA. One notable example is PA *-hu'ɬ 'stretch, pull' and its derivatives (with ɬ-) *-lu'ɬ 'drag, pull' and (with də-) *-du'ɬ 'crawl, pull self'. These stems share the peculiarity of failing to undergo stem vowel reduction in obstruent-suffixed forms. Hence Leer (1979) reconstructs PPA *-həwəs here positing that *-həwəs-X > *-hu'ɬ-X (instead of *-huɬ-X) remained as an irregularity in PA and modern Athabaskan; cf. further Eyak -wəs 'extend, move (as mass), pl. fall', (transitive with optional ɬ-) 'stretch O', (intransitive with ɬə-) 'stretch'. See Leer 1979.81-83 for non-reducing stems.

The unique ablauting obstruent-closed stems, PA (perfective) *-ƛ̓å'ʒ, (imperfective) *-ƛ̓e'š 'make soup, render fat', cf. Eyak ka'ʒ 'soup', and PA (perfective) *-hå'ʒ, (imperfective) *-he'š 'singe', cf. Tlingit -hiʒ 'singe', might be explained as earlier *y-internal stems, although reconstruction is extremely problematic here (see Leer 1979.-82-83 for data and discussion of 'stretch', 'soup', and 'singe').

Obstruent-closed stems which show no peculiarities (such as irreducibility or ablaut) within Athabaskan may have had internal sonorants at some stage in their history, as exemplified by the following comparisons: PA *-te'č' 'plural lie', Eyak -t'u'č'; PA *t'e̊'š(ʷ) 'charcoal', Eyak -t'u'č'-, Tlingit t'u‿č' (also Tsimshian -t'u'c'-); PA *de'ɬ 'crane', Eyak du'xɬideh (earlier documented du'ɬxideh), Tlingit

du'ł; note also Koy. də-l-duł 'call (of crane)'; < **dewł. Again, clearly, internal sonorants will have to figure importantly in reconstructions for ablauting closed stems as well as open, and for closed stems as well as open with different vowels such as these between Athabaskan and related languages.

There is, however, one PA broken stem which is almost certainly to be reconstructed with medial y, namely *łəyəs 'dwarf birch' (6.2). However, this occurs also in Tlingit and may be a diffusion from outside Athabaskan; alternatively, perhaps the first syllable was interpreted as a prefix, as also in *dənəɣ 'bearberry'. The remaining sonorant-medial broken stems are probably to be reconstructed with medial nasal sonorants.

Turning now to medial nasal sonorant stems, we have seen in 6.2 a number of *CVNəX stems, which, like *CVXəX stems, remained disyllabic through PA. PPA *CVNX stems, however, yield nasalized (*CṾ'X) stems in PA. This suprasegmentalization process may be compared with that (PPA *CəxX > PA *CɑX) postulated for *CVXX stems above, in that a segmental phoneme is absorbed into and simultaneously alters the preceding vowel.

In many languages, PA nasalization from PPA *CVNX is lost, as in Alaskan languages, including Upper Tanana and Kutchin. Thus PA *-tį'ł < PPA *-tən-ł 'handle sticklike object (progressive)' appears as UT -ti'ł, Kut. -čia' < *-tił. These languages do, however, have stem-internal nasalization in (originally) obstruent-closed stems, which in several cases

can be shown to derive from PA *CVNəX, as in the case of PA *təɳəɬ 'vessel', which appears as Upper Tanana tu-tɨˑɬ, Kutchin čion-tɨąh 'cup' < 'water-vessel'. From such examples, it can be seen that after original PA nasalization had disappeared, new instances of nasalized stems arose from the monosyllabization of nasal-internal broken PA stems. Monosyllabization also occurred in fricative-internal broken PA stems in these languages, so that e.g. PA *t'əɣəs 'cottonwood' appears as Tanacross t'aˑθ, Upper Tanana t'ɨ́ˑh, Kutchin t'aˑ.

These languages would thus appear to be diagnostic for original PA nasalization: if an obstruent-closed stem is nasalized in languages like Navajo and Chipewyan, but not in these Eastern Alaskan languages, then PA nasalization could be posited, whereas if nasalization is present in these Eastern Alaskan languages, then a PA broken stem is indicated. However, the development of *CVNX appears to be more complex than the above examples indicate. In the example 'nose' (below), it appears that PA nasalization is retained in these Eastern Alaskan languages. One possible explanation is that PA nasalization was retained (or reintroduced) in nouns with the prefix *n(ə)-. At any rate, in many cases we are not at present able to determine the source of nasalization for a given obstruent-closed stem, especially since the distribution of nasalization often cannot be sorted out into consistent patterns. In the following section we illustrate

the types of problems that arise.

We begin with noun stems which are reconstructible as PA *CV̨'X ‹ PPA *CVNX:

PA *(-)wi̯'ɬ 'snare, net' (where final *-ɬ may be the instrumental suffix): At. bi'ɬ, Tni. (tah-)viɬ, Ing. -veɬ, Hol. -meɬ, Koy. -biɬ, UK -miɬ, Tna. biɬ, Tnc. -mbí'ɬ, UT -bɪ̀'ɬ, Han -mèn', Kut. vìa', Hare beli (Petitot), NTu. -myán', Tset. ména, Tahl. miɬ (Thorman), Hare mí', -mílé', Brlk. mí, Sl. miɬ, Chip. bíɬ, Sek. mɪ̀ɬ (Young), Bvr. mí'l, -mílé, Sar. mɪ̀ɬ, Hag., Car. biɬ, Chil. binɬ [bi̯'ɬ], Gal. -beɬ, Hupa meɬ.

PA *-gi̯'ʒ-ə' 'gristle, cartilage', most often attested with *nə- 'face' as 'nose cartilage': At. -n-gi'ʒe', Tni. -n-giʒa, Koy. -n(ə)-giʒə', Tna. -n-ʒɪ̀ðà', Tnc. -n-ʒí'ð̂', (interdentals irregular), Kut. -n-ʒ̲ioh, Chip. 'i̯-ʒižé 'cartilage', Hupa -nən-gəʒə' 'gristle in salmon head', -da'-g̲ənʒə' 'gums ('mouth-gristle')', -ʒeyə'-g̲ənʒə' 'pit of stomach ('heart-gristle')', Nav. -ð'š-gę́'ž 'gristle, cartilage' (initial g unexplained, *ʒ expected).

PA *-n(ə)-či̯'x̱ 'nose' ‹ PPA *nə-čən-g (nə- 'face', -čən 'smell', -g 'repetitive'): At. -n-ci's, Tni. -n-čix̱, -čiš, Ing. -an-ce, Hol., Koy. (Lower) -nin-cəx̱, Koy. (Central) -n-cəx̱, Tna. -n-cix, Tnc., Kut. -n-ci̯h, UT -i̯'-ci̯'h, Chip. -ń-ci̯, Sar. -n-cíh, Car. -n-cis, Chil. -n-cinš [-ci̯'x], K-T [-n-cə̨s], Hupa -n-čəW, Nav. -'čí'h (prefixal -'čɪ̀š-).

'Nose' and 'gristle' share the peculiarity of having variants without internal n in the presence of prefixal *n(ə)-. This is most clearly seen in Hupa -nən-gə$\underline{\chi}$ə', which seems to be simply a metathesized form of *n(ə)-gən$\underline{\chi}$ə'. Likewise, the Holikachuk and Lower Koyukon form -nin-cə$\underline{x}$ 'nose' can be derived from *-nə-čən$\underline{x}$ by metathesis of stem-internal *n, and further Koyukon -n(ə)-cə$\underline{x}$ by analogical reinstatement of the simple prefix.

Some similar explanation may possibly be adduced for *qe'-(n-)č^{w}ə(n)s 'moccasin', attested only in Alaskan languages: At. qen-ci's, Tnc. kən-cɨ'θ, UT kan-cɨąh, Kut. koi'-čɨąh, as opposed to Ing. qa-čəθ, Hol. qa-cvθ, UK ka-čəš, Tan. ka-čəθ. Here, however, the variation is mainly between forms with nasal in both places and forms with nasal in neither. It seems likely that the stem for 'moccasin' was often influenced by the near homophone 'wolverine', which shows evidence of nasalization (synchronically or historically) in all Athabaskan languages: At. nał-ci's, Tni. nəł-čiš, Ing. nəł-čeθ, Hol. nəł-ciθ, Koy. nəł-cił, UK nəł-čiš, Tna. nəł-čiθ, Tnc. nah-cɨ'θ, UT nah-cɨąh, Kut. nãh-čɨąh. This item is almost certainly cognate with Eyak kəna's 'wolverine', implying something like PPA *k^{w}əN̓(ə)s.

'Wolverine' illustrates the frequent difficulty of distinguishing whether the stem was broken or nasalized. Here the stem is broken in Eyak but nowhere in Athabaskan, including the criterial Ingalik. Nevertheless, the Eastern Alaskan

languages have nasalization. This in itself is not adequate to indicate whether the PA stem was broken or nasalized, so we cannot at present draw a definite conclusion.

Another stem with nasalization of uncertain origin, with nasal prefix, is 'rosehip', absent in Ingalik and Holikachuk, but present in Tlingit k'inče·yi[27]: Koy. kuɣ, Tna. nəčuy, Tnc. nčú·θ, UT nčQ·h, Kut. niçɬh, Hare 'ɬšǫ', Nav. čǫ·h, implying PA *(kʼə-)n(ə)-kVR(ə)ɣ, where either the vowel or the sonorant is rounded.

In all these cases mentioned here, 'nose', 'cartilage', 'moccasin', 'wolverine', 'rosehip', we have stem-vowel nasalization distributed in various patterns, and a nasal prefix, interacting in various ways, one perhaps giving rise to the other (as is certain e.g. in one case already shown in 2.2, 2.4.2, Carrier [-ciŋɣay] 'brains', demonstrably < *-ci' -ɣa·ŋ'. Note also Koy. gəngəməł, ʒənʒəməł, addendum to p. 100.)

One possibility not yet considered is that nasality may have arisen in broken stems or compounds also where the medial was a <u>non-nasal</u> sonorant, or even a fricative. Two items in particular point in this direction. For the first,

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27. Probably a late borrowing with the Athabaskan indefinite possessive prefix *kʼə-, found here also in Hare as '-. Unfortunately, the Tlingit borrowing does not clarify the phonological history of this item, especially since the (originally prefixal) k' is not palatalized whereas stem-initial *k is palatalized to č. Perhaps indeed *ku· > če· illustrates a recent wave of palatalization in Tlingit itself. Furthermore, it is not clear if Tlingit y represents the PA medial or a backing of *y < *ɣ < *ɣ.

we may compare Koyukon -n(ɑ)q'ɑ-bəʒ-ə' 'soul, spirit, life force' (apparently a compound of -n(ɑ)q'ɑ(d) 'inside the eye' < *nɑq'əd < *nəx̣-q'əd (for *əx̣ > *ɑ see 5.3.1), and an unclear stem -bəʒ, perhaps from PA *-wəʒ̓ 'stretch, spread') with Tnc. -ų˙k'á˙ð˙˙, UT -ǫ˙k'ɬą', Kut. -n-k'ɬo˙, Han -n-k'ɬ̨˙, Hare -ɨhk'ǫ́', Chip. -(n)k'ązɛ́ 'shadow, soul, spirit'. Another likely compound is PPA *q'a'-səc'(-X) > PA *q'a̓˙za̓s 'quiver' ('arrow-skin'), Koy. q'olʌ, Tnc. k'á˙θ, UT k'ɬą', Hare k'ǫ́', Chip. k'ą́θ 'sheath' (k'á-k'ą́θ 'quiver'). Particularly in this case, provided the etymology is correct, it is unlikely that either of the PA elements of the compound included a nasal.

Yet another source of nasalization in the modern languages, or another factor in the complex patterns and distributions of nasalization we now see, as in some of the above, is the spread of nasalized vowels in certain favored environments, especially before stem-final sibilants. In one Tanacross noun list, for example, the following examples of unanalyzable obstruent-closed nasalized stems were found: kəncɨ˙θ 'moccasin', nahcɨ˙θ 'wolverine', cɨ˙ð˙˙ 'otter', nčų́˙θ 'rosehip', -č'ų́˙ð˙˙ 'veins', č'əɬč'ų́˙ð˙˙ 'sparrow hawk'. Similar concentrations are found in Chipewyan: šɨ́θ 'wart', -ʒɨ̨ð 'make tearing noise', -bąθ/bąð 'roll', -k'ą́θ 'stretch self', -gų́θɛ́ 'fish scale', θųθ 'spear', -ê'ų́θ 'suck', -č'ų́θ 'stream out water', -yɨs/yɨz 'stoop', -šɨ́s/šɨs 'whistle', -ʒɨzɛ́ 'cartilage', -k'ųs/k'ų́z 'blush', -k'ųz 'sour'; or, for example, in Chilcotin, -gąŝ/gęẑ 'twist', -k'^{w}ęz 'kidney', -k'us/k'^{w}ęz 'cut with scissors', -č'ęz 'black eye', -ʒęŝ

'hook', 'əsc'ą̨z 'fly', among others, here even with reduced vowel, where there is no historical reason to expect nasalization. Note also fn. 22 for a similar trait in Navajo. In Eyak, of 38 stems with c-series initial and full -i- vowel, 32 have nasalized (or in a few cases optionally nasalized) -į̨-, whereas in the 10 stems with č-series initial and full -i- vowel, only two are nasalized. Thus there must be in Eyak a strong tendency for nasalization to develop in e.g. ci˙ but not či˙.

Analysis of all the available data for a full study of Athabaskan nasalization will not be attempted here. The present object has been to indicate in general terms the most likely sources of nasalization, and the numerous problems encountered in correlating the data. In particular, however, we may discern that the major sources of nasalized vowels are PA *CVNəX and PA *CV̨˙X < PPA *CVNX.

7.0 Na-Dene Sonorant Systems

7.1 The Proto-Athabaskan Sonorant System

In the earliest preliminary versions of this paper (1975), we symbolized the palatal nasal as *ñ, since we viewed it as a palatal or palatalized counterpart to *n. In the later versions of that paper (1976) we symbolized it *$\tilde{y}$, viewing it as a nasalized counterpart to *y, and emphasizing that it was often realized with incomplete oral occlusion. Likewise, then, the nasal labial was symbolized *$\tilde{w}$. In the present paper, the palatal nasal is symbolized *n̲, and the labial

*m (or *$\underline{\eta}_2$ or *$\underline{\eta}^w$), with symbols conventionally used for orally occluded nasals.[28] A major justification for this change

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28. Just at the time we were contemplating resymbolizing *$\tilde{y}$ and *$\tilde{w}$ as *η and *m, we received a letter from H.-J. Pinnow containing a "Kurzen Entwurf" on the subject of these sonorants, in response to the earlier version of this paper. Pinnow's thoughts on the matter, although not entirely in agreement with our own, certainly argue interestingly in favor of *$\underline{\eta}$ and *m as basic symbolization. Following is an extract from his statement:

"Klar ist, dass der erste Laut [*$\tilde{y}$] nichtlabial, der zweite [*$\tilde{w}$] aber labial war, und dass beide Laute nasal gesprochen wurden. Nicht ohne weiteres leuchtet es indes ein, dass es sich bei beiden Lauten um Nichtverschlusslaute handelt. Es wäre durchaus möglich, hier die entsprechenden nasalen Verschlusslaute anzusetzen, also *$\tilde{n}$ (= $n^{\tilde{y}}$) und *m, die häufiger in den Sprachen der Erde Verwendung finden als die nur ganz selten und auch dann kaum als Phoneme auftretenden Laute $\tilde{y}$ und $\tilde{w}$. Ferner steht zur Diskussion, ob nicht statt *$\tilde{n}$ besser die Entsprechung des Ingalik anzusetzen wäre, also das velare η. Hierzu gibt es einige Gründe. Setzen wir die Gesamtvertretungen auf eine gemeinsame Linie, so ergibt sich folgendes:

	Nasal Velar Verschl.	Nasal Velar Enge	Nasal Lab. Vers.	Nasal Lab. Enge	Oral Velar Enge	Oral Lab. Enge	Nasal Palat. Versch.	Nasal Pal. Enge	Oral Pal. Enge	Nasal Alve. Vers.	Nasal (Pal. Vokal	Oral Pal.) Vok.
A) 1.	η						$\tilde{n}$	$\tilde{y}$	y			i
2.	η						$\tilde{n}$	$\tilde{y}$			ĭ	i
3.	η						$\tilde{n}$			n		ø
4.	η	$\tilde{y}$			ɣ	w			y			i
5.	η	$\tilde{y}$		$\tilde{w}$		w						
B) 1.			m	$\tilde{w}$		w						
2.			m							n		

Nehmen wir η und m als Ausgangspunkte an, so ergeben sich klar verständliche Entwicklungsgänge: Palatalisierung (A1-3), weitere Verschiebung nach vorn zu n (A3), Lösung des Verschlusses (A1-2, A4-5, B1), darauf z.T. folgende Entnasalierung (A 4,5, B1). Dazu kommt, dass η und m direkt in einer Sprache (Ingalik) belegt sind. Wählen wir hingegen $\tilde{y}$ und $\tilde{w}$ als Ausganspunkte, so ist der Entwicklungsgang schwieriger zu verstehen: Es müsste z.T. Verschlussbildung und Velarisierung eingetreten sein. Direkt belegt sind ausserdem $\tilde{y}$ und $\tilde{w}$ wohl nicht. Der Grund, dass die beiden genannten Autoren trotzdem $\tilde{y}$ und $\tilde{w}$ angesetzt haben, liegt vielleicht darin, dass zumindest *η bzw. eben *$\tilde{y}$ silbisch sein kann, z.B. in dem von Leer angenommene Perfektsuffix (p. 38 u.a.). Aber Nasale

(continued next page)

is that we do find, in stem-initial position, contrasts between what must have been (phonetically) nasalized /*y/ and /*w/ in [*ỹV̨N] and [*w̃V̨N] contrasting with /*n̲/ and /*m/ in /*n̲VN/ and /*mVN/, so that for stem-initial position the use of the symbols ỹ and w̃ for the distinctively nasal sonorants is somewhat misleading. The symbols *n̲ and *m (or *$n̲^{w}$) are also phonetically more correct for stem-initial (i.e. prevocalic) position, where articulation was much more fortis than in stem-final (i.e. absolute final or preconsonantal) position. Most Athabaskan languages maintain an occlusive (often by now even obstruent) articulation of the nasal sonorants stem-initially (the main exceptions being Carrier

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(fn. 28, continued)

kommen häufig in silbischer Funktion vor, z.B. in den indogermanischen Sprachen, und die Entwicklung geht auch dort häufig zum Vokal, z.B. *n̥- 'Negativmarker' wird a- im Sanskrit und Griechischen ("Alpha privativum"). So können wir die erwähnten Rekonstruktionen wohl besser als *ŋəɬ ['Keil'], *təŋə ['Weg'], *-qɑɑŋ' ['Gatte']; *dəm' ['Fliege'], *həmx̲ ['alterer Bruder'], *mæG ['Auge'] ansetzen."

It will be noted that the considerations which led to our changing the symbolization of the nasal sonorants from /*ỹ, *w̃/ to /*n̲, *m/ are not theoretical, but rather the distributions and initial contrasts [ỹ]/n̲, [w̃]/m in __VN, discussed here. Note further that we had to reject the hypothesis that *n̲ was velar *ŋ rather than palatal (see 7.6.1), and that the initial *m or *w̃ Pinnow is here referring to ('eye', rather than 'wedge') is in response to the earlier version of this paper, before we recognized /*$n̲_2$/ as /*$n̲^{w}$ = *m/.

y for *ŋ and *m, and Kwalhioqua-Tlatskanai w for *m). Thus stem-initially the phones [ỹ] and [w̃] existed but here they were allophones of *y and *w (/__VN).

In stem-final and preconsonantal position, on the other hand, where articulation was much more lenis, the nasal sonorants must have been frequently or usually pronounced without complete oral occlusion, occlusivity there being certainly non-distinctive. Thus in stem-final position the phones [ỹ] and [w̃] also existed, but here they were instead allophones of /*ŋ/ and /*m/. The occlusivity of /*n/ itself in final position is perhaps questionable; there was in any case no opposition there between -Vn and -V̰.

The symbols ỹ and w̃ then are phonetically appropriate for what were allophones of both /*y/ and /*w/ (initially), and /*ŋ/ and /*m/ (finally). They are therefore used in this paper only specifically as phonetic symbols.

The basic structure of the PA sonorant system would then be as follows:

w		y
[w̃]		[ỹ]
m	n	ŋ

with [w̃] and [ỹ] both as nasalized initial allophones of w and y and as non-occlusive (final or preconsonantal) allophones of /*m/ and /*ŋ/.

The system may be explained phonetically in terms of four features to distinguish the sonorants:

	w	w̃	m	n	ŋ	ỹ	y
nasal	-	+	+	+	+	+	-
occlusive	-	-	+	+	+	-	-
coronal	-	-	-	+	-	-	-
round	+	+	+	-	-	-	-

The phonetic rules are:

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$$\begin{matrix} R \\ [-nas] \end{matrix} \rightarrow [+nas] / __ V \begin{matrix} R \\ [+nas] \end{matrix}$$

$$\begin{matrix} R \\ [+occ] \end{matrix} \rightarrow [-occ] / __ \left\{ \begin{matrix} \# \\ X \end{matrix} \right\}$$

by the reversal of a single feature. (See Addenda.)

The exact nature of *m (*$ŋ_2$ or *$ŋ^w$) becomes also much less problematical in terms of these distinctive features. For one thing, the usual merger of /*m/ with /*ŋ/ and not directly with /*n/ is now explained by the reversal of a single feature [+rd] › [-rd]. The position of primary closure, labial [m] or palatovelar [$ŋ^w$], is left indeterminate and non-distinctive, and for the non-occlusive final allophone [w̃] (and for /w/) the question does not even arise.

As described especially in 5., in stem-final position the features of the sonorants tended to spread to the vowels, often leading to absorption and blending, in the form of nasalization and/or ablaut, and loss of the sonorant as a segment. Stem-initial sonorants, on the other hand, nowhere disappear and practically never interact with the stem-vowel (apparent exceptions are 'eye' and 'pluck', 3.1). In fact there is a strong tendency to obstruentization of stem-initial sonorants, described in detail in 1. and 4.

7.2 The Eyak Sonorant System

In Eyak, the sonorants form a distinct phonological class phonetically, morphophonemically, and distributionally. They are never obstruent or voiceless (all Eyak obstruents are voiceless); they all show nasal-non-nasal pairing, alternations, or variation; they all occur stem-initially, stem-internally, and (in a limited way) stem-finally.

Taxonomically there are five, w, m, l, n, y, or ten, if the stem-initial preglottalized ones are counted as single segments, thus:

w	l	y	'w	'l	'y
m	n		'm	'n	

The pairs w/m and l/n both contrast with each other and alternate with each other, in different ways, and y has nasal allophones. We shall demonstrate the status of each individually within Eyak phonology, and then examine correspondences with Athabaskan and Tlingit sonorants.

7.2.1 Eyak w and m

The labial sonorants w and m contrast stem-initially and -internally, but not finally, where only w occurs. Initial examples for the contrast are ma· 'lake', we·gš 'semilunar knife'; 'uma· 'his mother', 'uwa· 'for him'; 'əɬmahd 'cook it!', 'iɬwahd 'for each other's sake'; sdi'mahdɬ 'it's been cooked', si'we·šG 'my maternal grandfather'; 'ɨ·sdima'ɬ 'it got hurt', 'ɨ·sdiwa'ɬ 'it's been sifted'; and even in qu'ləd^{ə}mɨhɨh 'he'll get hurt', q'e' qu'd^{ə}wɨhɨh 'he'll swim back'. In the last

pair the nasalized vowel is the result of a late synchronic process: mV̨ occurs only before umlauting third person relative enclitic, here -eh-i̱h and -ah-i̱h both → -i̱hi̱h. Historically at least (though not synchronically or phonetically) stem-initial mV might well be interpreted as wV̨. There are in fact only about five Eyak stems with initial m: l-də-ma' 'get hurt, botched', ma' 'lake', ma' 'food' (nursery term), -'mahd 'cook', '-ə-mah 'mother' (vocative); for 'uma' (< *'uwą') 'his mother', cf. e.g. siyą' [siyą'] 'my mother' (see 2.1.2.3), but this case is unique in Eyak, and the process not (quite) synchronic. Stems with initial w are much more numerous, about 40, but only two are with -'w-: -'we'šG 'maternal grandfather' and O-'wi'g 'hang pl. O in series'.

There are about 27 stems with internal w or m. Of those with m, 16 of 17 begin with g k k' ɢ q q' x̣, especially the back velars (12); and of those with w 10 of 11 begin with g k k' x and (especially, 5 items) x̣. Since modern Eyak lacks labialized front or back velars (with the marginal archaic exception of some unstable g^w, x^w), the predominance of internal labial sonorants in Kə__V, Qə__V surely suggests a historical process of *K^wV, *Q^wV > KəWV, QəWV, the latter specifically QəmV where Q is a stop.

A number of such stems alternate with monosyllabic stems, as in -x̣əwa's ~ -x̣a's 'itch', -ɢəməc' ~ -ɢəc' 'twist', -xa 'grow', 'i̱'łxəwah 'red ribbon seaweed'. At least two pairs suggest historical alternation between m and w, as in x̣əwa' 'dog', -x̣əmah 'growl', and -gəwi' 'feel', -gəmi' 'taste', -ga' 'know', presumably from *$x̣^wV(N)$ and *$g^wV(N)$.

The only certain labial-sonorant-medial stems with non-velar initial are ʒəwəł 'net' and ʒəməʒ-ə-kih 'chatterbox'; the former might be a diffusion or contraction, cf. conceivably PA *-wɨ̓'ɬ 'snare, net', and the latter onomatopoetic.

There are one or more thematic noun-prefixes of the form wə-, in wə-šəh 'name', -wə-lah 'spiritual owner', wə-χ̣ah 'story'. Third person possessor and object of postposition is 'u- (not wə-). There is no m in Eyak prefixes.

Stem-finally m does not occur, and there are only a few instances of w, in loans from or through Tlingit, -ša'w 'head (of hair)', na'w 'whiskey' ‹ Tlingit, ‹ Jargon la'm 'rum', in the nouns q'əw 'provisions' and qəw 'clearing (on slope)' (cf. qih 'meadow, clearing (in sky)'), the postposition o-χ̣əw 'even with o' (cf. -χ̣əwi' 'agree', χ̣u' 'right'), and in two adjectives (noun-suffixes): -'a'w 'long' (as verb -'a', noted in 5.1), and -'ləw (~ -'nəw, and as verb -'li', -lu') 'big', conceivably related (PAE *-'a(')m??). Early (Rezanov 1805) transcriptions for these adjectives generally imply -'a'wa , -'ləwa (-aya, -лега). Evidence for lost final and internal w in Eyak has been noted in connection with ablaut (5.1), internal sonorants (6.4), and PA-E(-Tlingit) correspondences (7.3.2, 7.3.3, 7.5 (end)).

7.2.2. Eyak l and n

The contrast between the Eyak nasal and non-nasal coronal sonorants, n and l, is also firmly established synchronically,

but historically rather shallow. There is moreover frequent alternation between n and l, but with different conditioning from that between m and w, and in this case the process is denasalization, n > l.

Stem-initially l and n contrast in e.g. ne'ƛ' 'soon, first', le'ɬ 'hair'; sini'k' 'my nose', sila't' 'my tongue'; sdi'na't'ɬ 'it got licked', sdi'li'c'ɬ 'it got soaked'. The sequence -lɣ is common with umlauting 3rd person relativizing enclitic, də-leh-ɨh→ dəlɨhɨh 'he says', but there are no other synchronic instances of -lɣ.

Of about 65 stems with initial coronal sonorant, about 5 show -'l-, two -'n-, and one, -'ləw ~ -'nəw 'big', shows n ~ l alternation. Stem-initial -'n- occurs only in three verbs, -'ni'q' 'swallow', -'na't' 'lick' (cf. -la't' 'tongue'), and -'nik' 'creep'. Stem-initial -n- (aside from exclamations, diffusions, and ne'ƛ' 'soon, first') occurs in only three nouns, -ni'č'- 'septum of nose', -ni'k' 'nose', and -ni'sq' 'nostril'. Stem-initial -n- also occurs as an alternant of -l- in postpositions and adjectives directly preceded by the -ˑ- allomorph of the thematic, classificatory, and anatomical prefix 'head, face' prefix, and compounds thereof, thus si'nah 'around my head' (cf. silah 'around me', sita's 'over me', silətа's 'over my head'), ya''a'nuhdg 'a few things (of l-class)' (cf. ya'luhdg 'a few things', ya'dəluhdg 'a few (houses)'), wəɬ'a''nəw 'big wedge' (cf. yahdda'ləw 'big house'). This also occurs in one verb stem in the unique gerundial

nominalization li'x̣i'ni' 'laughter' (cf. li'x̣ ləxleh 'I laugh'). Perhaps the 'nose' nouns have a similar origin, pre-Eyak *-nə-ni'X, but no longer show the prefix as such, as in sini'k' 'my nose'. Historically, it would seem that PAE initial *n > l normally in Eyak, except in marginal forms, and where preserved by preceding *-nə-, and where preglottalized in three verb stem initials (two of which refer to oral activity).

Internally both n and l occur, in about 20 stems, l in about 15 and n in 5. There is one clear case of alternation: łila'' 'man, male', łəni''-kih 'little boy'. The initial in about half these cases is an affricate, and a back velar in the other half, with only one clear-cut instance of front velar, in kəna's 'wolverine'. It is by no means clear to what extent medial l and n may derive from a feature of the stem-initial (as may be the case of w and m), but they must also derive at least in part from originally postvocalic n, as will be shown in the correspondences with Athabaskan.

Stem-finally l and n are rare and marginal. The best instance is xi'l 'shaman', but the early transcription in Wrangell 1839 clearly implies [xi'la] (хиила); c'əl 'bone' is the only other (noted in 2.2), but this has an archaic variant c'əlih, and possessed form -c'əlih. There are other instances of final l, but these are suffixal, as in q'a'l 'now' (cf. q'a'-ya' 'new', q'ah 'already', etc.), and gerundives formed from verb-stems, 'isda'l 'sitting', 'iste'l 'lying', 'isa'l 'going', the suffix remaining -l even after a nasal vowel, as in 'isc'ą'l 'strength', k'ucį'l 'singing'; and probably also in qe'gu'l 'thunder(bird)' (< qa'-i-g^{w}a'-

'dancing up out, suddenly'?). Stem-final -n- may occur in xa'nih 'very old salmon', perhaps a diffusion, but absolute final -n only in a few loans, as k'uɬdiya'n 'grouse'. The synchronic stability of the l/n contrast is thus nevertheless quite clear.

The prefix lə- thematic, anatomical 'face, head', and class marker is very frequent, and often combines with other such marks, as x̣ə-lə- 'genital', or in ku'lə- 'belly', x̣u'lə- 'teeth', ti'lə- 'pelt', qi'lə- 'rope', which when followed by C optionally become -į̇'-, x̣ą'-, kų'-, x̣ų'-, tį'-, qį'-, again clearly showing the nasal origin of l.

The virtual absence of stem-final l and n, and the frequency of nasal vowels in Eyak, clearly points to the process Vn > V̨'/__$^{\#}_{C}$, which, if we add a rule something like n > l/__V, covers most of the synchronic situation, but not quite all.

The demonstratives also involve w and l, but in a rather special way. 'This (thing)' is 'əl and 'that (thing)' is 'əw; cf. 'ą'-(d) 'here', 'u'-(d) 'there', (-')ləx̣ 'thus (this way), (-')wəx̣ 'thus (that way); and as enclitics in e.g. de'dəl 'what's this?', de'dəw 'what's that?'. See 7.3.1.2 (end) for further discussion, especially of (-')ləx̣, (-')wəx̣.

7.2.3. Eyak y

The situation with Eyak y is somewhat simpler in that here there is no nasal-non-nasal contrast. Of about 37 stems with initial y, 4 (verb stems) can be discerned as -'y-. When followed by a nasal vowel, y optionally but usually becomes

nasalized by synchronic rule, y → [ỹ, n̲, ⁿ] /__Ṿ, as in x̣əḍi'yąh 'it's sharp' [-i'yąh, -i'ỹąh, -i'n̲ąh, -i'ⁿąh], or even [-i'nyah], often with more nasalization on preceding vowel than following; likewise with epenthetic -y- initial as in siyą' 'my mother', 'idiyi̧hi̧h 'he is of certain size' < 'ə-di-ah-i̧h, but not in k'uɬdiya'n 'grouse', for example.

There are about 28 stems with internal y, of which perhaps 10 start with č-series, 7 with c-series, and about 4 each with k- and q-series, though especially with k- and q- the first syllable may be prefixal, as clearly in k'iya't' 'fish meat' (see 2.1.1), though not in e.g. giyah 'water', -giyił 'bewitch'. Where followed by nasal vowel, internal y is nasalized as is initial, as in -q'əyąh 'homeland', 'əyąh 'poor thing!'.

Stem-final y is rare. The most stable instance is k'u'y 'wind' (a remarkable parallel to xi'l 'shaman' including the lengthening, here k'^{w}ə- > k'u'- as explained above; Rezanov 1805 transcriptions also consistently imply [k'u'ya] or [k'u'yə] (къ-уя), as does modern k'u'ya'ləw 'big wind', implying disyllabicity (not *k'u'y'a'ləw, as opposed e.g. to sahs'a'ləw 'big sea otter'). There are some unstable instances after -i'- or -i̧'- in -ci'(y) '(man's) daughter', ci'(y) or ci̧'(y) 'mussel', ci'(y) 'song; branch', surely four stems, partly confused, and influenced by the strong Eyak tendency for the spread of nasalization in ci- > ci̧-. Another such stem is łi̧'y 'kind of wood' (barely remembered; noted in 2.2). Final y in -i̧'y is [ỹ] or [n̲]. Two other stems of this type also

with medial (perhaps originally initial) y are k'əyɨ'y 'other, different' (~ k'ɨh-; < k'u-yɨ'y ?, v. addenda), and -q'əyɨ'y in ɢədəq'əyɨ'y 'fog', -ləχ̣ədəq'əyɨ'y '(baby's) eyebrows' (with variants -q'əyɨh, -q'ənih; < -q'ə-yɨ'y ?).

There are at least two prefixes of the form yə-: yə- anatomical 'hand', rarely thematic, and -yə- in a few in-law terms. These do not alternate with -i'- as does (y)i- 2s. subject or neuter (see 2.3.).

7.2.4 The features of nasality and glottalization in Eyak sonorants

We have seen that the nasal-non-nasal contrast for m/w and n/l, though well established synchronically, is marginal and/or of late historical origin, earlier w probably having nasal variants, like y, when followed by nasalized vowel, and with n/l the reverse, earlier n becoming denasalized except when preceded by nasalized vowel; nasalized vowels were derived from *Vn/$__^{\#}_{C}$.

Very different from the superficiality of the nasal-non-nasal contrast is the contrast for the preglottalized initials, however. As we have seen, these occur in a minority of cases, in about 16 of 145 sonorant-initial stems, but clearly attested for all 5 sonorants. The preglottalization, however, is manifested only where preceded by a vowel, e.g. sa'mahdɬ 'it cooked', but səɬmahdɬ 'you cooked it', ma'dk' 'it (customarily) cooks'. Thus the preglottalization can be identified only in verbs,

(inherently) possessed nouns, postpositions, and adjectival suffixes. Since the 'R- cannot occur as such in absolute initial position (most nouns, preverbs, adverbs, and other categories), it can also be said that there is no contrast in absolute initial position, that these stem-initial sonorants (about 45 of the 145) are indeterminate for preglottalization, and that of course many of them might in fact historically be from *'R-. There is no way to determine, for instance, whether ma˙ 'lake' was *'ma˙ < *'wą˙. The proportion of stems with preglottalized initial sonorant is thus more correctly about 16% for determinable instances. We shall return to this subject in examining Eyak-Athabaskan correspondences.

Stem-internally if there were ever glottalized sonorants in the history of Eyak there is no clear evidence for them now, e.g. no significant number of historically unanalyzable-looking stems of the form CV'RV(C). One of the very few cases is ča'nik'-ł 'funny' (the -'nik' may be a stem, cf. -'nik' 'wriggle', with unidentified prefix čə-, or ča'-, or especially čą'- (cf. -čą́ 'smell'). The rarity of such cases is conspicuous.

Even more conspicuous, however, is the total absence of stem-final -'R or -R'. (The sequence R' or RC hardly occurs at all in Eyak, certainly not morpheme-internally). This is in sharp contrast to Eyak stem-initial sonorants, and also to Athabaskan stem-finals, where R'# is comparable in frequency with R#.

7.3 Proto-Athabaskan - Eyak sonorant correspondences

In the following discussion of Eyak-Athabaskan correspondences, we shall first deal with sonorants in stem-initial position, by far the simplest and most conservative, and then those in final and medial positions, about which we understand much less.

7.3.1.1 Proto-Athabaskan and Eyak stem-initial sonorant correspondences

To PA stem-initial *w *n *y the regular Eyak cognate non-glottalized sonorant initials are w (m), l (n), y, respectively. For *w : w (m) we have seen the following examples (1.2): *-we:-we 'sg. swim', *-wə̀t' 'belly':wət' 'vomit', *we·š:we·gš '(semilunar) knife'; *wən:ma· 'lake'; to these we may add e.g. *wì̯·ɬ:we'ɬ 'snare', *-wà·l:-wa'ɬ 'hang suspended', *-wa·n'-:-lə-wa'ɬ 'edge'. Examples cited (2.1.2.1) for *n : l (n) are *-nì·g 'move hand' (perfective):-le'g^{w}; *-ni:-le 'say', *-na·ɳ$_2$:-la 'drink', perhaps *nu· 'island': lu· 'tide (flats)'; to these we may add e.g. *-na:-la 'move', *nà·-tV-:la'd- 'two', *nəx̣- (etc.):ləx̣ə- 'eye' (prefixal, 3.1), *nə-:lə- 'facial, head' (prefix in both nouns and verbs). Examples for *y : y are *ya·:ya·-q'-d 'sky'; *-ya·ž(^{w})-:-yahš '(woman's) child'; *-yu·:-yu· 'plural'; *yəx̣d:yahd 'house' (6.3); *-ye·n:-yą́ 'sharp' (2.1.2.2). (These were contrasted with *ɣ:x in *-ɣə̀c'-:-xəc'- 'hill', *-ɣʊ̀ʌ':-xu'ʌ' 'blow', *-ɣa·č':-xa'č' 'knot', *-ɣa·ɳ:-xa 'grow', *-ɣən-:xi·l 'shaman';

and in 2.1.2.3 with *h (h~Ø~R): Ø (Ø~R) in e.g. *-haɑd- 'older sister':-əd- '(man's) sister'; *-ha'n:-ą' 'mother'; *-ha'ŋ:ɣ-a 'eat', *-he'n:-ą'' 'sg. stands'.)

The correspondences between PA initial *ŋ (and *$ŋ_2$ or *m) and Eyak are less easy to establish due to fewer data and greater complexity. We shall include here discussion of *'ŋ (and *'$ŋ_2$ or *'m) as well. PA *-$ŋ_2$əł 'pour' (*-$ŋ^w$əł or *-məł) and Eyak -'ił are very probably cognate, but the labialization in PA or lack of it in Eyak is not explained. PA *$ŋ_2$əł (*$ŋ^w$əł or *məł) 'wedge' and Eyak wəł are entirely clear, with Eyak loss of nasality; preglottalization cannot be determined. PA *ŋə- '2s.' , Eyak 'i-, yi-, and PA -ŋa't' 'fish flesh', Eyak k'i-ya't' show the same Eyak loss of nasality. For PA *ŋən' 'land', in view of the above, the Eyak preverb yą'' 'down to rest' (< PAE **ŋan') is a more likely cognate than 'ąh 'land' (for which cf. Tlingit 'a^n 'inhabited land'. Presumably then, the basic stem-initial correspondences are *ŋ:y, *$ŋ_2$:w; *'ŋ:'i (< *'y), but *'$ŋ_2$:'i also.

7.3.1.2 Preglottalized initial sonorant correspondences

As noted above, whereas the nasality contrast for Eyak sonorants appears to be rather superficial, there is in Eyak a set of preglottalized sonorants which contrast with the non-preglottalized sonorants in a way which seems to have a deep historical basis. In Athabaskan, on the other hand (and in Tlingit), there appears to be no reason for reconstructing

*'R. The closest we may come to this for Athabaskan is the widespread stem 'plural float', perfective *-'e'ɬ', suffixed *-'ʊ̓ɬ-, already recognized by Sapir as (pre-PA?) initial *'^{W} (ledger; Newman and Haas notes, April 8, 1936), no doubt correctly for pre-PA, as labialized ', on the pattern of *-ɢé̓'d~*-ɢ^{W}əd- < PPA *-ɢ^{W}e'd 'poke', rather than as glottalized w. The Eyak cognate for 'plural float' is very probably 'u'ɬ' 'driftwood'. Another cognate set of a similar type is clearly PA *wəs 'riverbank', Eyak 'uhs, theoretically implying *'wəs as opposed at some point to *'^{W}əs, which, if like *-'^{W}əɬ, would yield unattested *'ʊs. These are the two clearest cognates for *'^{W} or *'w; they do not alone suffice to decide whether for PAE the initial was a glottal stop labialized, like K^{W} and Q^{W}, or a glottalized sonorant, as in Eyak.

For Eyak -'mahd 'cook' an Ath. cognate may be Hupa -mɑd 'cook', Tol. -mæd, -bæd, <*-wɑd? (v. Addenda), attested only in PCA, however. For Eyak -'na't' 'lick', Athabaskan *-na't' is attested at least in Apachean, California, and Carrier, and for Eyak -'ni'q' 'swallow', Athabaskan *-né̓q' (perfective), *-né'x̣ is very widely attested. For the Eyak verbs with initial -'y- there are no clear Athabaskan cognates. Correspondences for Eyak -'iɬ 'pour', PA *-ŋ$_{2}$əɬ, and Eyak 'i- '2s.', Athabaskan *ŋ̣ə- were mentioned above. It appears even from these few instances that there is no explanation for the Eyak glottalized initials (except perhaps the '2s.') other than original PAE stem-initial **'R. This **'R was somewhat unstable and normally lost the preglottalization in Athabaskan, but not (always) in

Eyak. The labial in 'plural float' is the Athabaskan exception, reinterpreted on the basis of e.g. *-ɢə̀'d~-ɢ^{w}əd- (*-QV'X~-Q^{w}VX-) from reduced and full **-Q^{w}VX), to avoid resulting alternations like *-'e'ʎ'~-bəɬ- (< *-'e'ʎ'~-'^{w}əɬ-). It is also very interesting, even amazing, that the initial here is still treated in Navajo not as ', but as an ordinary obstruent, e.g. yɪ̀''ðɬ 'we are floating along' (Robert Young, 1981), with D-effect as ø, rather than *yɪ̀'t'ðɬ as expected with stem-initial '-, as in yɪ̀'t'ą̀š 'we are walking along'.

Contrast between reduced (unmodified) vowels i ə u (i.e. without following ', h, ') in Eyak stems is very limited, with distinctive u occurring only next to front velars (from PAE labialized front velars) and distinctive i ə and u only after stem-initial ', e.g. -'əš-g (not *-'iš-g) 'sneeze', 'iʎ' (not *'əʎ') 'mountain', unlike [dəɬ = dɬɬ = diɬ] 'blood'. One reason for such a distinction after '- (only) may be seen then in -'iɬ 'spill', the probable Eyak cognate for PA *$\underline{ŋ}_2$əɬ, presumably PAE **-'$\underline{ŋ}$(^{w})əɬ > *-'$\underline{ŋ}$əɬ > *-'yəɬ > -'iɬ. In fact, since Eyak stems with -'Rə exist only very marginally (only (-')ləx̣, (-')wəx̣, and -'nəw~-'ləw, see below), there is no possible contrast -'yəX:-'iX, so that we might thereby eliminate distinctive unmodified -i- in stems altogether, thus interpret e.g. 'mountain' as 'yəʎ', 'pour' as -'yəɬ, were it not for the fact that e.g. 'poured' is dəsə'iɬ, not *dəsa'yəɬ (cf. sa'mahdɬ 'cooked', and below).

Similarly, Eyak 'i- 2s. possessor, object of postposition, and direct object of verb, and 'i' independent pronoun corresponds

with PA *ŋə-. As subject, however, Eyak 2s. is yi- (after C, V', and initially; -ə- + (y)i- → -i'-), so that it is difficult to determine whether the ' and/or the y are epenthetic. Cf. also 3s. possessor and object of postposition, Eyak 'u-, PA *wə-.

Given the paucity of comparable forms, only part of the PAE sonorant system can be reconstructed on the basis of adequate data; only fragments remain from the preglottalized members and the nasals other than n. It is clear, however, that these also must have been present in PAE, and that Eyak tended to lose the nasalization, while Athabaskan lost the preglottalization.

Tlingit, as we shall see, tended to lose both distinctive features. Nasality in Tlingit will be discussed below. Preglottalized initial sonorants are totally lacking in Tlingit, but there are at least two apparent cognates with Eyak that imply *'R- > R for Tlingit: Eyak -'lahs 'intestines', Tlingit na^s, and Eyak -'li'c' 'wet', Tlingit -nac'~-naʌ'.

Since neither Tlingit nor PA show evidence of having stem-initial glottalized sonorants, one might be tempted to challenge the Eyak evidence by explaining Eyak initial 'R- as from 'əR-, especially considering the presence in Eyak of disyllabic noun and verb stems of the form XəRV- and the absence of such stems of the form 'əRV-. In fact there is an apparent instance of such development in (-')wəx̣ 'thus, that way' (cf. 'əw 'that'), (-')ləx̣ 'this way' (cf. 'əl 'this'). However, with proclitic də- 'exactly, ipse', these are

[dəˈwəx̣, dəˈləx̣]'just so, still', phonologically non-canonic, instead of the expected canonic *daˈwəx̣, *daˈləx̣ (cf. saˈmahdł 'cooked', not *səˈmahdł). These forms show the extreme lateness of this development, still at a level very close to the surface interpretable as /dəˈəwx̣, dəˈəlx̣/; cf. o-x̣ 'by means of o, becoming o'; cf. likewise (-')wəx̣k' 'that many', (-')ləx̣k' 'this many', dəx̣k' 'how many?'. More importantly, of course, the cognates we have for Eyak 'R- in Athabaskan and Tlingit all clearly show R-, not 'VR, as we have just seen; in fact we have seen here the contrary in 'plural float', 'riverbank', and 'spill', which suggest instead PAE 'R- > Eyak 'V- in *'w- > 'u-, *'$\underline{n}_2$- > 'i-; this moreover is parallel to the development PAE **XV > Eyak XəRV, e.g. **Q^wV- > QəmV-, strongly suggested in 6.1, 7.3. Thus evidence is overwhelmingly that Eyak 'RV- is original and not from **'əRV-.

7.3.2. Proto-Athabaskan - Eyak stem-final sonorant correspondences

In stem-final position, as mentioned above, Eyak sonorants are very weakly preserved as such. The few instances of final sonorants (other than in loans, or suffixal -l) have archaic disyllabic forms: cˈəl(ih), xiˈl(a), kˈuˈy(a), -ˈləw(a), -ˈaˈw(a) attested in early documentation. There are absolutely no instances of final -R'#, for, as we shall see, R is totally lost as such in that position. Correspondences for PA *-$\underline{n}$(') : Eyak -(') are adequate to demonstrate this, as shown in 2.2, *-cə$\underline{n}$':-ce', *-tə$\underline{n}$':-te', *-qɑ$\underline{n}$':-qa', *-čə$\underline{n}$':-ša' (?),

*təŋə:ta', *-ta'ŋ:-tah, *dəŋ:-de', *-de'ŋ:-de, *-ɣa'ŋ:-xa, *-ha'ŋ:-a ('eat'); neuters with perfective PA suffix: *-le'-ŋ: -łeh, *-žu'-ŋ:-ʒu'.

For PA final -y('), Eyak cognates are PA *č'^{w}i' = *č'^{w}əy, Eyak k'u'y(a) 'wind' (cited in 5.3), and PA *q'ɑy' 'willow', probably Eyak q'a' 'bushes', again with *-R' > -' in Eyak.

In the discussion of Athabaskan ablaut, it was shown (5.1, end) that final y and w are normally deleted in Eyak without affecting the (full) vowel, hence e.g. PA *-ƛ'u' 'bind', Eyak -ƛ'i (< PAE **-ƛ'iw), PA *ce' 'stone', Eyak ca' (< **cay), and not showing ablaut, hence PA *-la'/-le' 'handle plural', Eyak -ł-a (< PAE **-ł-hay).

For PA final *-m(') (= -ŋ$_2$(') = *-ŋ^{w}('), [w̃(')]), probable Eyak cognates are in PA *-dəm' 'bloat':Eyak -du' 'stuff', and PA *-ɢəm' 'lukewarm':Eyak -ɢu' 'warm', and perhaps PA *-na'ŋ$_2$, Eyak -la 'drink', where labiality is preserved in the Eyak vowel before -'.

This appears also to be the case for the non-nasal in Eyak -x̣u' 'fur', PA *-ɣa' (Tlingit x̣a^w, see 5.1, end), but not in ła' 'glacier', PA *łu', or ta' 'into water', PA *tə'- 'into water', *tu' 'water' (5.3).[29]

Eyak has also always changed or deleted PAE stem-final *-n('). Aside from the two instances of Eyak denasalized -l

29. Two Eyak verbal prefixes show interesting variation of this type qu'- 'future' and -u' 'semitransitive, directive', having the variants qu'wə- or qa'- and -u'wə- or -a'- immediately preceding -(ł-)stem, probably < *qəẇ, *-əẇ-, or the like.

(in 'bone' and 'shaman', both disyllabic until recently), Eyak has deleted the *n, sometimes nasalizing the vowel, sometimes without a trace. Thus, with nasalization, PA *n̲əɴ' 'land', Eyak yą́' 'down' (perhaps also ya' 'to rest'); PA *-čən 'smell', Eyak -čą́; PA *-ha'n 'mother', Eyak -ą'; PA *-ɡən 'stick, base', and *-ɡa'n 'rain; belly, pregnant', Eyak -kɨh 'stick', -ką' 'abortion', -kʊ'-, -kəmah 'belly, base' (certainly a complex set); PA *-ɣe'n 'melt', Eyak -x̣ą, PA *-ye'n 'sharp', Eyak -yą́; PA*-he'n 'sg. stand', Eyak -ą''; also PA *wən 'lake', Eyak ma' < *wą'. Examples of deletion without nasalization are PA *-ta'n 'classificatory long object', Eyak -ta; PA *-q'a'n 'burn', Eyak -q'a; PA *ǯʷe'n 'day', Eyak gah; PA *še'n 'summer', Eyak xah;[30] PA *-ɣɑn' 'in relation to', Eyak -x̣a'; PA *-č'-ən' 'to', Eyak -č'-a'; PA *-wa'n'- 'edge', Eyak -wa'ł; PA *-t'a'n' 'leaf', Eyak -t'ahł 'leaf, feather'. In at least one case, where PA probably has suffixal -ə', Eyak has a disyllabic stem with medial -l-: PA *-ɢa̰'nə' 'arm', Eyak -ɢəla' 'shoulder', if cognate.

Where labialization is present, either in the stem-initial or the vowel, Eyak may have deletion, with or without nasalization of vowel u, and/or may show medial labial: PA *qʷən'

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30. The correspondences PA *-e'n, Eyak -ą, -a, showing here in *-ɣe'n:-x̣ą, *-ye'n:-yą́, *-he'n:-ą'', *ǯʷe'n:gah, *še'n:xah, can be explained as reduction, PAE**-e'n > pre-Eyak *-ən > -ą or -a. Cf. also the PA *-ən('):Eyak -ą('), -a(') correspondences here for 'land', 'smell', 'lake', 'to'. Cf. further PA *-'e'n 'see' and the ablauting Eyak -'eh#/-'ą-:, also besides gah 'day', ge'lə-'a'g 'noon' (-'a'g 'middle', ge'lə- evidently < unreduced PAE**gʷe'nə-).

'fire', Eyak qu̯'-, in qu̯'-də-x̣a' 'by the fire'; PA *q'u'n' 'roe', Eyak -q'u' 'spawn', but q'əma' 'roe'; PA *-γ̣^{w}ən 'growl', Eyak -x̣əma (also x̣əwa' 'dog'). See 3.2, 6.1, and 7.6 for further discussion.

7.3.3 Proto-Athabaskan - Eyak stem-internal sonorant correspondences

Athabaskan-Eyak correspondences are most difficult of all for stem-internal sonorants. The general subject was undertaken in 6., wherein it was shown that disyllabic stems with medial sonorant exist for both Eyak and Athabaskan. Eyak stems of the form CVRV(X) are fairly common and many are listed in 6.1; in Athabaskan there are something over a dozen stems of the form CəRəX, listed in 6.2. It was also shown that disyllabic stems in Eyak may have cognates in Athabaskan, but those are monosyllabic, and there are clear indications, considered in 6.1 and 7.2.1-3, that at least many of the Eyak medial sonorants are of various types of secondary origin, e.g. *Q^{w}V > QəmV. Monosyllabic stems with internal sonorants, of the form *CVRX, are also posited at least for PPA and PAE; a few instances of **CayX and **CewX are noted as explanation for closed-stem ablauts and correspondences such as PA*-ke'š/ *-kå'ʒ 'make soup', Eyak ka'ʒ 'soup'; PA *-tå'š,-te'č' 'pl. lie', Eyak -tu'č', PA *de'ɬ 'crane', Eyak du'ɬ-, Tlingit du'ɬ (5.1, end; 6.4). PA stems of the form *CVNX are also considered, 5.2 and 6.4, but regular correspondences for these with

Eyak are very difficult to establish. Finally, there are a fair number of Eyak obstruent-closed stems with nasal vowel, implying PAE **CVNX, but PA cognates usually do not show nasalization, e.g. Eyak -kɥ'd 'grab', PA *-ƛ̓ú'd, Eyak -kɨ'x̣ 'weep', PA *-č^{w}ə ɣ̣, momentaneous perfective *-č^{w}ʔé' ɣ̣. In fact, for some of these PA has reduced vowel, which according to statements in 2.1.2.2, cannot be derived from **CVNX (or **CVRX), which always develops full vowel, *CV'X; thus, nevertheless, Eyak łąhd 'smoke', PA *łəd; Eyak ƛ'ɨ't' '(audible) fart', PA *ƛ'ʔət'; Eyak -kɨhd 'move hand quickly', PA *-č^{w}əd; Eyak -k'ɨ't' 'scratch', PA *-č'^{w}ʔət'; Eyak sɨ'ł 'shoes', PA *səł, *-sƛ'- 'leggings'. These suggest a secondary origin for at least fome of the Eyak nasalization (see fn. 5). One exception, if cognate, may be Eyak sɨ's 'mold' (by assimilation *xVs > sVs), PA *x̣ʔ'ʔ's 'wart' (see fn. 22). Clearly, much comparative work remains to be done on stem-internal sonorants.

7.3.4 PPA *l

There is in Athabaskan a small number of stems beginning with *n which share the peculiarity of having Ø-initial allomorphs following the ł-classifier. The ł-classifier is then phonologically reinterpreted as the stem-initial consonant and voiced like other stem-initial fricatives. Thus these stems occur with initial n/l alternation in modern Athabaskan languages. The existence of this type of alternation introduces the possibility that at an earlier stage there existed two phonemes which have

fallen together as *n. The first, which did not delete after the ł-classifier, we could reconstruct as PPA *n, and the second, which did delete, as PPA *l. Our hypothesis would thus be that *-ł-lV > *-łV > *-lV. It is to be stressed, however, that this PPA *l would have been a sonorant, that is, the non-nasal counterpart of *n, whereas PA *l is a fricative, the voiced counterpart of *ɬ, and that they are in no way equatable, PA *l having arisen long after the proposed merger of PPA *l with *n. To avoid the possibility of such confusion of these two, we have not mentioned PPA *l up to this point.

Stems showing this PA *n/l alternation are few: PPA *-li in PA *-neˑx̣/-leˑx̣ 'become, do (so)' imperf. (fut. *-niˑł/-liˑł), possibly also in Alaskan Athabaskan *-li 'sing O' < *-ł-li, cf. *-ni 'say'; PPA *-li in PA *-ni/-li 'expect (good or bad)', *-lək'-X in PA *-nə̀x̲/-lə̀x̲ 'taste'.[31]

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31. PA *Complement#(hə-)š-neˑx̣ 'I do (so)', transitive *Complement#(hə-/O-)š-łeˑx̣ 'I do (so) to O, cause O to be (so)': Koy. də-snax̣, də-slax̣, Kut. t'-ihnjii, Car. 'ə-sneh, 'ə-ʌeh, Chip. 'a-snɛ, 'a-słɛ, Nav. 'á-šné'h, 'á-šłé'h, Hupa (theme) 'a#-nəw 'do so'. The perfective stem is suppletive, PPA *-ha'x̣ or *-ha'ɢ, yielding PA *Compl.#(hə-)š-də-yå'x̣ (-yå'ɢ) 'I did (so)' (note də-classifier) and *Compl.#(hə-)š-łå'x̣ (-łå'ɢ) 'I did (so) to it', etc.; PA o-yå'#(h-)uˑ-niˑ 'o is expected', trans. o-yå'#(h-)uˑ-š-łiˑ 'I expect o': Koy. x̣ɑyo-'uni (or -li), x̣ɑyo-'usli, Kut. g-oˑniąˑ, g-oihłiˑ (Koy., Kut with *qʷə- areal pp. obj. and direct obj. in trans.), Chip. o-yá-huni, o-yá-husłi alongside o-yá-hodeni 'o is suspicious', o-yá-hodɛsłi 'I suspect, dislike o'. Pairs with l-classifier instead of Ø- are: Car. a-ulni 'he is timid, cautious', o-(y)a-usʌi 'I am wary, fearful of o' or 'I take great care of o, guard o jealously' (some confusion in Morice here); Nav. bàˑ 'àyàhòˑlnì 'he is under suspicion', bàˑ 'àyàhòˑšłì 'I am suspicious of him'. Finally, PA *łə-nə̀x̲ 'it tastes (good)' and *(hə-)š-łə̀x̲ 'I taste it' provides the only common stem other than *-ni/-li: Koy. lənəx̲, 'əslix̲, Kut. andãiˑ, 'ihłãiˑ, Car. (su)'əlnih, uzəsʌi, Chip. łəní, həsłí, Nav. hàlnì, yiˑšłį̀h. Compare also Nav. nàhòniš̀nìn ~ -łìn 'I look like him'.

There may have been other such stems where the *ɬ-classifier has been generalized as root-initial, so that n-initial variants can no longer be found.

Eyak stems with initial l- behave in a somewhat similar manner, in that some of them delete after ɬ, as follows. Initial -l- of postpositions is optionally (sometimes perhaps preferably) deleted after the -ɬ- of 'iɬ- reciprocal o, and ɢə-ɬ- 'o-most of a series': thus o-li' 'deeply into o', 'iɬli' or 'iɬi' 'into each other', ɢəɬli'd or ɢəɬi'd 'inner-most of series'; such variation is attested for five of the eight l-initial postpositions, and can probably be presumed for the three others. The initial -l- of verb stems, on the other hand, may <u>not</u> optionally be deleted after ɬ-classifier, e.g. in o-d O-ɬ-la 'give o O to drink' from O-də-la, or O-ɬ-leˑčˈɬ 'pick O (berries)'. However, of ten such verb stems, there are two in which l-initial is <u>obligatorily</u> deleted after ɬ-classifier: O-ɬ-i 'act upon O' from -le 'act', and O-ɬ-u'g 'move O with hand', from -le'g(^{w}) 'move hand'. The former is of course cognate with PA 'do', which behaves in an analogous way, while the PA cognate to -le'g(^{w}) does not. The reason for the shift in vowel height -le → -i, -le'g(^{w}) (*-i'g^{w} ?) → -u'g^{w}, is not clear.

However, the Eyak evidence, except for these two somewhat irregular verb stems, both of high frequency, does not provide very strong support for a non-nasal counterpart to *n in PAE.

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The empty position in the PAE table, if not filled by **l and **'l, may perhaps then best be considered that of h (= Ø) and ' (glottalized Ø), if these should properly be included in the sonorant class (as open vs. closed glottis is a property of obstruents and vowels as well).

7.3.5 Summary for the Proto-Athabaskan-Eyak sonorant system

To summarize the results of comparing the PA and Eyak sonorant systems, especially for stem-initials, the PAE inventory must have been much like that for PA as shown in 7.1., but with the added feature of glottalization, as still in Eyak:

*w		*y	*ẇ		*ẏ
*m	*n	*l̲	*ṁ	*ṅ	*l̲̇

The empty position would be filled either by l and 'l (non-nasal counterpart to n) if such existed; otherwise abstractly by h (=Ø) and ' (glottalized Ø).

In initial position Eyak lost the nasalization, but not the glottalization, while PA lost the glottalization but not the nasalization. The same is basically true for the sonorants in final position, but here they are articulated more weakly in Athabaskan, and tend to delete totally (except for the glottalization, and some nasalization from *-n) in Eyak. Initially *Ṙ may have been preglottalized ['R-] (as in Eyak), and finally there may have been postglottalized [-R'] (as in PA).

7.4 The Tlingit Sonorant System

The Tlingit sonorant system consists of only four members: w n y ɣ. Unlike PA and Eyak, therefore, Tlingit has no contrasting nasal and non-nasal sonorants, and no preglottalized sonorants. The sonorant ɣ is of special interest here. Phonetically it is a non-nasal voiced velar approximant [ɣ̞],[32] which is at present found only in the speech of a few older speakers, most notably among Yakutat and Tongass Tlingit. This phoneme was merging with y already during the past century in the central Tlingit dialects, so that by now only the easternmost and westernmost dialects retain the distinction. Swanton and de Laguna record this phoneme as y, and in other early sources it is recorded as g (by the Russians), gh (by the English), and r (by Krause).

An important feature of this sonorant is that like the velar and uvular obstruents, ɣ is labialized next to u. This labialized variant of ɣ is phonetically identical with w ([u̯] = labialized [ɣ̞]). Hence w has two sources: original w and labialized ɣ. For further information see Leer 1978, especially pp. 8-9.

In Yakutat and Tongass Tlingit, all four sonorants occur syllable-initially, and all but y occur syllable-finally.[33]

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32. It is definitely misleading to transcribe this as ɣ or r, since ɣ is unquestionably a sonorant, whereas ɣ normally symbolizes an obstruent. Furthermore, ɣ or r may be taken to imply a uvular, which ɣ definitely is not.

33. A couple of exceptions are found among the interjections: Southern Tlingit ha'ɣ 'give it here', from ha'hi', the Northern Tlingit form, and 'uy (a shout).

Thus all instances of syllable-final y in the central dialects of modern Tlingit must be derived from y; the sequence *uy is not found, since uy > uw.

Another interesting fact concerning syllable-final sonorants is that they are allophonically nasalized in Interior Tlingit (phonetically, the whole syllable is nasalized). Thus for example t'a'w 'feather' is [t'ą'w̃] whereas t'a'wáG 'goose' is [t'a'wáq]. The same nasalization is sometimes recorded in early sources, especially Veniaminov (1846), which records the above as t̄áum and t̄auáq. Syllable-final y appears as nasalized y in Interior Tlingit, as in t'a'y [t'ą'ỹ] 'heat, hot springs'. Veniaminov records this as t̄an 'hot springs', and t̄aň 'hot', where n, ň probably represent nasalized y (i.e., lax ŋ). (Note that he did not write *t̄ain or the like. Unfortunately Veniaminov gives no explanation of his phonetic symbols.)[34]

It thus seems probable that at the time of European contact, all syllable-final sonorants were (non-contrastively) nasalized in Tlingit, phonetically n, w̃ [ų̃], ỹ [ĩ̯] . Thus the possible syllable-initial and -final sonorant arrays must have been as follows, allophonically:

initial	w	n	y	y
final	w̃	n	-	ỹ

34. Interesting confirmation of the relationship between y and ŋ is seen in the diffusion Tlingit šayi'n, Haida səŋi'n 'nail', origin and direction of diffusion undetermined.

It is not hard to visualize how this scheme may have developed from an earlier stage of the language where a partial contrast might still have been found for nasality in the sonorant system. We shall postulate the following system for Pre-Tlingit, where the nasal labial sonorant w̃ is represented as *m, and the nasal velar sonorant ỹ as *ŋ (occlusivity not specified).

non-nasal:	*w		*y
nasal:	*m	*n	*ŋ

At this stage, a syllable could begin with any of the sonorants, including perhaps *m, but could end only with the nasal sonorants *m *n *ŋ (where *m may also have been the syllable-final allophone of *w). Such a system explains very simply the absence of y (i.e. of earlier y) in modern Tlingit finals. We postulate that syllable-initially the nasal sonorants then became denasalized, so that *m, if any, merged with *w, and whatever nasality contrast there may have been was lost. This then gives us the system described above, where the syllable-initial possibilities are w (< *w, *m?), n, y, y̲ (< *ŋ), and the syllable-final possibilities are w (< *m), n, y̲ (< *ŋ), but not y. Subsequently the non-phonemic nasalization on final w and y̲ was lost outside of Interior Tlingit.

For some older speakers of Tlingit, n may also be sporadically denasalized to l, especially syllable-finally. This phenomenon was first noted by Krause (1885; English translation, 1956.233): "An individual variation in pronunciation, which may be due to a dialectic l, should be mentioned here, namely, the tendency of single individuals, men as well as

women, to change n to l and to say 'hil' instead of 'hin', meaning water or river." This non-phonemic denasalization appears to be the logical end-point of an historical tendency toward denasalization of Tlingit sonorants, n being the only remaining nasal sonorant.

It should also be mentioned that in Interior Tlingit m and l have marginally phonemic status. l is found only in a few Athabaskan loanwords such as dale'yí 'lake trout'. The sources of m are more varied: syllable-finally in Chinook Jargon loans, e.g. gamdá'n 'horse' ‹ Jargon gəwəda'n or the like; but cf. wasú's 'cow', Tongass waswu's, ‹ Jargon məsmu's or the like; in the contracted form of the wu- perfective marker wu › w̃ › m/V_CV (where CV is a verbal prefix, see below); in a few Athabaskan loans such as ʒimasasi' 'songbird sp.'; and stem-initially only in má'#sá 'how'. This last is particularly interesting, since there is no apparent reason why this should not be wá'#sá as in coastal Tlingit. Perhaps this morpheme preserves all that remains of an initial Pre-Tlingit *m as distinct from *w.

The perfective prefix wu-, mentioned above, is instructive. In combination with the 2s. subject pronoun i- this becomes yi-, revealing wu- as underlying /yu-/; y is labialized (i.e., merges with w) next to u, whereas yu › y/__i, so that y is not labialized. Now where contraction results in loss of the prefix vowel, labialization is retained in the case of -yu- (=-w̃u-) › -y^{w}-(=-w̃-) (Interior Tlingit -m-, Coastal -w-; as above,

whereas -yi- , -y- (Interior Tlingit -ȳ-, coastal -y-). Veniaminov also records -m- as in Interior Tlingit, e.g. Veniaminov kamzit'ix̄, Interior Tlingit kamʒitíx', elsewhere kawʒitex' 'it's crooked, bent'.[35]

Now if we posit *ŋu- as the pre-Tlingit form of the perfective prefix, in the contracted form of the prefix we find the equation *-ŋ^{w}- = *-m-, the same indeterminacy that we considered above in the reconstruction of PA(E) sonorants (3.1, 7.1). In Tlingit, as also in PA(E), it does not seem to be possible to make a clear distinction between a labial sonorant (w, *m) and a labialized velar sonorant (y^{w}, *ŋ^{w}).[36]

7.5 Correspondences for Tlingit, Eyak, and Athabaskan Sonorants

From the cognates which may provisionally be established between PAE and Tlingit, the following correspondences for stem-initial (or at least prevocalic) sonorants are suggested:

PAE	*w	*n	*y	*ŋ	*ŋ$_2$
Tlingit	w,u	n	i,y	y,i	y

35. Traces of the nasal in Coastal Tlingit are indicated where Swanton records certain perfective forms with contracted -n- in place of -w- before the indefinite human subject prefix du-, e.g. kʌ'ndułiayi hît (1909.382.5), Interior Tlingit kamduʌiya'yi hid, elsewhere kawduʌiya'yi hid 'house which was lowered (into place)'. In such forms n may be explained by postulating assimilation of m to the following apical instead of the usual denasalization.

36. In his fieldwork on Tongass Tlingit, Leer tried to see if a phonetic contrast could be established between original w and w from y next to u, but with negative results.

**w:w

PA *-n-we'ɢ- 'eye', Eyak -la'x, Tl. wa^ɢ

PA *-wa'n'- 'edge', Eyak -wa'ɬ, Tl. -wan

PA *-wa (-we) 'pale, gray', Tl. -wu 'white(-skinned)' (in e.g. ǯan-wu 'mountain goat', kid-wu 'white killer whale')

PA *-wə̀č'~-wə̀š- 'cheek', Eyak -lu'č' 'inside of cheek' probably < *-lə-wəč', Tl. -waš 'cheek'.

**w:u

PA *-we 'sg. swim', Eyak -we, Tl. -hu 'sg. swim, wade'

PA *-(h)u(')nəɣ̇-ə < PPA *-wənəx̣- (?, a difficult form to reconstruct precisely) 'older brother', Eyak -x̣əwəx̣ '(man's) older brother' < *-həməx̣ (?), Tl. hunx̣^{w}

PA *-we'ǯ^{w} < PPA *-we'g^{w} 'cook by boiling' (see also fn. 16), Eyak -wa'k' 'become tender by boiling', Tl. -'ug 'boil'

PA *wə-, Eyak 'u- (3rd person postpositional object and possessive prefix), Tl. hu (3rd person independent pronoun).

**n:n

PA *nu' 'island', perhaps Eyak lu' 'tide (flats)', Tlingit nu^w 'flat defensible island, fort'

PA *də-na'q̲$_2$ 'drink', Eyak də-la, Tl. d-na

PA *-ni'x̲/-ni'g̲ 'move hand; sense', Eyak -le'g^{w} 'move hand', Tl. -nig^{w} 'feel'

PA *-n(ə)-ni'k'-ə' 'nostril', Eyak -ni'k' 'nose', Tl. -nix' 'smell'

PA *-na't' 'lick', Eyak -'na't', Tl. -nut' 'swallow'.

**y:i,ɣ

PA *yəx̣d 'house', Eyak yahd, Tl. hid

PA *yəx̣, *yəG 'down', Eyak yəx̣, Tl. 'i'G 'beach' and preverbal ɣi^G or ɣe^G 'down toward beach'[37]

PA *-yu' (plural suffix for nouns denoting humans), Eyak -yu', Tl. ɣan

PA *-yi̯' (-d) 'inside o', Eyak -ya' 'in o with broad opening at top' and/or -yəq' 'in o without broad opening at top', Tl. -ɣi^ 'inside o (house)', and/or -ɣiɢ 'inside o (basket, boat, river, road)

PA *łəyəs 'dwarf birch', Tl. łe^ɣis (surely a diffusion).

**ŋ:ɣ

PA *ŋən' 'land', Eyak yą'' 'down' and yą'- ~ yən- 'to rest on surface', Tl. ɣan 'shore' (as preverb 'to rest'), ɣanax̣ (preverb) 'into earth', and ɣa^ ~ ɣe^ (preverb) 'down'

PA *ŋə- (neuter/perfective prefix), Eyak (y)i-, Tlingit ɣa- (classifier, see 2.3, 8.), and possibly also wu- (perfective prefix, < ɣu-, see above).

**ŋ:i

In the second person singular pronouns:

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37. Compare the semantic opposition in the Athabaskan and Tlingit pairs: Ath. *yəx̣, *yəG 'down' and *dəG 'up', Tl. 'i'G (preverbial ɣi^G, ɣe^G) '(down toward) beach' and da'G (preverbial da^G) '(up toward) interior, woods (from beach)'. In Eyak, however, these directionals are not paired: yəx̣ 'suspended downwards', dəG 'upstream'.

	Independent	Object,Poss.	Subject
Ath.	*ʔən	*ʔə-	*ʔə-
Eyak	'i˙	'i-	(y)i-
Tlingit	wa-'e	'i-	i-

**ʔ$_2$:ɣ

PA *ʔ$_2$əɬ 'wedge', Eyak wəɬ, Tl. ɣi˜s; Ath. *ce˙-ʔ$_2$əɬ 'stone adze', Tl. ta-ɣi˜s (Eyak təwi˙s borrowed from Tlingit)

PA *-ʔ$_2$a˙n' 'across, on the other side', Tl. di-ɣa˙

An outstanding gap in the above correspondences is a source for Tlingit y. One obvious possibility is seen in Athabaskan *-yi˙ɣ-ə' (if not *-χi˙ɣ-ə') 'spirit', Tl. yɛ˙g '(shamanistic) spirit', although one is tempted to connect the Athabaskan item with *-χi˙k' or *-χi˙č'^{w} (?) < PPA *-xi˙k'(^{w}) 'breathe' and possibly *-χəš(^{w})-X 'whistle', Eyak -xe˙g (Tlingit -'e˙g^{w}). The tangle of phonological and semantic connections here is difficult to sort out.

Final sonorants appear to have dropped in Tlingit under conditions difficult to specify. There are a number of cases where final sonorants are seen to drop in verb stems, e.g. ka˜ɣ 'measure' (n.), -ka˜ 'measure O'; t'a˜ɣ 'heat, hot springs', -t'a 'be hot'; 'ad 'i˙wu 'cooked food', -'i 'cook O'. In some of the examples below Athabaskan retains final sonorants which are missing in Tlingit; in others, the reverse is true. The first two examples raise the possibility that Tlingit e is by origin (at least in some cases) a secondary vowel (i.e. e˜ < *aɣ or *aŋ).

PA(E) **-ǫ̲:Tlingit Ø

PA *-ž^{w}əǫ̲ < PAE **-x^{w}əǫ̲ 'black', Tlingit ša^xe^-yi 'mountain shadow' and xe^- or xi^- (incorp. noun) 'dusk'

PA *təǫ̲ə 'trail', Eyak ta', Tlingit de^

PA *-ta'ǫ̲-ə' 'integument, bark, membrane', Eyak -tah 'skin' (and prefix -ti'-lə- 'pelt, leaf'), Tl. -da^-yi 'outer bark', and -da^ 'outer (enveloping) surface, around o'[38]

PA *dəǫ̲ 'know (how)', Eyak -de' 'understand', Tl. -da (with o-ẋ) 'be(come) used to o'

PA *-qɑǫ̲' 'husband', Eyak -qa', Tl. qa' 'man' (possessed -qa'-wu)

PA *-ha'ǫ̲ 'eat', Eyak ẋ-a, Tl. -ẋa

PA *-na'ǫ̲$_2$ 'drink', Eyak -la, Tl. -na.

Further possibilities are:

PA *-ci̓'-y̓a'ǫ̲' 'brain', Tlingit -ƛa-ɢe^-yi; PA *-cəǫ̲' 'flesh', Eyak -ce', Tlingit ʎi^y.[39] Alternatively, Tlingit ʎi^y may be cognate with PA *-le'ǫ̲(-) 'green (wood), fresh (meat)'.

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38. Correspondences with PAE *t and Tlingit d as in 'integument' and 'trail' can be claimed, since such a possibility is raised by variation within Tlingit itself, e.g. in ka-daʒ-a^ ɣe^d 'basket for knocking berries into', where ka-daʒ-a^ is an otherwise regular instrumental noun derived from O-ka-ł-taʒ 'knock O (berries) off bush'; cf. also fn. 39.

39. PAE:Tlingit correspondences such as *c:ƛ and even *c:ʎ must indeed be considered, since there occur even within Tlingit itself dialectal and lexical variants showing alternation between plain and aspirated stops (see e.g. fn. 38), also between affricate series, as in kawłiʎa' = kawłiƛa' 'sediment settles', 'akawłiča' 'he strained it', and correspondences between PAE sibilants and Tlingit laterals are predominant: to take only a few examples, PA *-dȧ'z~-da·s 'heavy', Eyak -da·s, Tlingit -dał (also -das 'too light'; cf. -łe 'far', -se 'near').

PA(E) **-y:Tlingit Ø

PA *-ɢɑy 'white', Tlingit -ɢi˙ or -ɢe˙ 'bright, shining'

Possibly also PA *q'ɑy' 'willow', Eyak q'a' 'bushes',
Tlingit x̣'a˘ɬ-x̣'e˙ 'dwarf maple'.

In a few cases Tlingit retains final sonorants which have dropped in Athabaskan or Eyak. Outstanding examples are:

PA *-ɣa-' (*-ɣa˙- in compounds) 'hair', Eyak -x̣u' 'fur', Tlingit -x̣a˘w-u 'hair' and -x̣a˙w 'be hairy'

PA *t'a˙ 'feather', Eyak -t'ah-ɬ 'feather, leaf', Tlingit t'a˘w 'feather'

PA *-t'e˙ (imperf. *-t'ɛ̀˙s, with suffix -c', see fn. 22 and Leer 1979.51) 'roast' and *-t'e˙x̣ < PPA *t'e˙-ɢ 'raw', Eyak t'e˙-ɢ 'raw' (cf. Eyak -ɢ negative suffix), Tlingit t'a˘ɣ 'heat, hot springs', and -t'a 'be hot; be ripe'

Eyak duh 'hose kelp', Tlingit da˘w.

See Addenda for PA(E) **-n:Tl. -n.

7.6 Na-Dene, Haida, and Tsimshian sonorant systems

7.6.1 Na-Dene sonorants

We shall now first compare the PAE and pre-Tlingit sonorant systems, and attempt to reconstruct, on the basis of the PAE-Tlingit correspondences noted above, a Na-Dene sonorant system.

PAE	*ʔʷ		*ʔʸ		*w		*y				
	*ʔm̲	*ʔn̲	*ʔŋ̲		*m̲	*n̲	*ŋ̲				
Tlingit					*w		*y	>	w	n	y	ɣ
					*(m?)	*n	*ŋ					

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In both systems, of course, *m may equally well be symbolized *$\underline{ŋ}^{w}$ or *$ŋ^{w}$. The most important difference between the systems (other than loss of glottalization in Tlingit as well as PA) is the clear difference in position of articulation between *y and *ŋ in Tlingit, since denasalized *ŋ becomes modern Tlingit y, with the opposition to y maintained by position of articulation.

Again, in terms of distinctive features, including nasalization, a Na-Dene system can be reconstructed simply in which the exact position of primary articulation for **$\underline{ŋ}$ and **y is indeterminate, just as for **$\underline{ŋ}_2$ and **w:

-coronal		
	-round	
		-nasal **y
		+nasal **$\underline{ŋ}$
	+round	
		-nasal **w
		+nasal **m (=**$\underline{ŋ}^{w}$)
+coronal		
		-nasal (**l?)
		+ nasal (**n)

PAE *$\underline{ŋ}$ must have had the same position of articulation as *y, since everywhere in Athabaskan (where still distinct from *n) it appears as a palatal (Hagwilgate-Carrier y, Kutchin (etc.) final -ỷ, all Athabaskan prefixal -i̯-, -i-), the only

exception being ŋ in Ingalik (and in some archaic Carrier finals); here Eyak also, very importantly, shows y, i.[40]

The Tlingit cognates for PAE *y are not very different from those for PAE *ŋ̲: Tlingit y and i, though perhaps predominantly i for PAE *y and y for PAE *ŋ̲. The data are too few at this point for determining any more than this. With the labial pair, on the other hand, while *w remains stable, both Athabaskan and Tlingit have a tendency to delabialize the nasal initially, thus PA *$ŋ̲_2$ > *ŋ̲ (all Athabaskan except PCA and Kwalhioqua-Tlatskanai), corresponding Tlingit items y, evidently so also in Eyak -'iɬ 'pour' < *-'$ŋ̲_2$əɬ where preglottalized, but not in wəɬ 'wedge' < *$ŋ̲_2$əɬ.

The feature ±glottal must be reconstructed for PAE on the basis of Eyak alone; as shown above (7.3.1.2), this has disappeared in Athabaskan with hardly a trace (e.g. 'pl. float') and is apparently lost entirely in Tlingit (e.g. Eyak -'lahs, Tlingit na^s 'intestines'). Stem-initially **ʔR may have been 'R- as in Eyak, while finally there may have been -R' as still in much Athabaskan, and also -'R. Thus cf. PA *-qɑ̨ŋ̲' 'husband,

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40. We have seriously considered the possibility that at one or more points in the history of Athabaskan, PA, or PAE, what we have here reconstructed as *ŋ̲ was in fact velar, as in pre-Tlingit, rather than palatal with the same point of articulation as *y. Pinnow (1980) argues persuasively for this; there is no denying that ŋ (and $ŋ^w$) are more frequent and "natural" (?) in the world's languages than ŋ̲ and $ŋ̲^w$. Moreover, since a shift PAE *k > PA *k̲ (> most modern Athabaskan č) is well attested, there is further temptation to posit a parallel PPA (?) *ŋ > PA *ŋ̲. However, since the Eyak cognates to PA *ŋ̲ are clearly y (and to PA *-$ŋ̲_2$əɬ 'pour' evidently -'iɬ) it becomes much more difficult to hold this hypothesis, and much simpler to consider *y and *ŋ̲ homorganic in PAE.

male', Eyak -qa', Tongass Tlingit -qa', < **-qaŋ' or **-qaŋ̓ on the one hand, and on the other, PA *-ɣ̣a-' 'fur', Eyak -x̣u', Tlingit -x̣a^w, < **x̣a'w or **x̣aw̓, where the difference may be in the position of glottalization and/or in gradation of the vowel. Data are probably adequate for fruitful further enquiry in this area.

With the possible exception of a **ŋ^w, none of the sonorants postulated above is unusual or hard to justify from the standpoint of neighboring languages. In considering the possibility of areal influence, we have in mind primarily those languages such as Haida and Tsimshian which share a number of old diffused items with Athabaskan, Eyak, and Tlingit; the existence of such old diffusions appears to indicate prolonged contact between these groups. We shall therefore conclude with brief sketches of the Haida and Tsimshian sonorant systems.

7.6.2 Haida Sonorants

The Alaskan Haida sonorant system is given below. Our limited contact with Canadian Haida has sufficed to assure us that at least this array is common to the present dialects.

non-nasal	w	l	y	
	'w	'l	-	
nasal	m	n		ŋ

To these Sapir (1923) adds 'y as well as a complete set of preglottalized nasals, including data which he claims establish 'm and 'ŋ. Preglottalized sonorants occur in stem-initial position only.

The glottalization contrast is in fact diachronically problematic, especially in the case of w, y vs. 'w, 'y. In the first place, post-initial semivowels are found in Haida, especially following velars and uvulars, so that syllables like Kya, Kyu, Kwa, Kwi are common. This raises the possibility of interpreting syllables such as 'wa and 'yu as initial ' + semivowel + vowel. In the case of 'la, however, such an interpretation is impossible, since *Kla is not a canonic syllable type.

In our present Alaskan Haida corpus, the only stems found to begin with original 'w (by comparison with Canadian Haida) are of the shape 'wa'(C), e.g. 'wá' 'yonder; do thus', Skidegate (Sapir) 'wʌ-si' 'that thing', (Kess) 'wa 'to do', 'wá'na' 'dig (shellfish)', Skidegate (Leer) 'wanɢe, (Sapir) 'wa'ngɑ, 'wá'da' 'sell', 'wá'łəł 'give potlatch'. In the one example of 'wi', namely -'wi' 'fall', initial glottal stop is from earlier ɢ (as shown by Skidegate -ɢwi).

Outside of loanwords such as wúl 'wool' and wa'hú' q'ust'əná'y 'Oahu crab', i.e. 'turtle', initial w is attributable to earlier h=Ø initial, e.g. wuná' 'dull', Skidegate (Kess) hu'ne /hunə/ and wah-da' 'bark', where wah- < *(h)waχ < *huχ- by a prehistoric rule that inserts an a before *χ > h. There

are also a few stems like -w(u)nəŋ 'roll' where initial w before u presumably reflects an earlier *x̣ or *x (we unfortunately lack Skidegate data).

Thus we have no clear evidence of original w except as derivable from *hu, and we have evidence for original 'w only where followed by a.

With y and 'y, however, the situation is significantly different. 'y is clearly attested in Skidegate 'yu-'ən 'big' (Sapir 'yu''ɑn), Alaskan Haida 'íw'a'n or 'í'wa'n, and in Leer's transcription 'yat-juu /'yəd-ʒu/ 'corpulent', Alaskan Haida 'id-. These could quite properly be reinterpreted as /'iw-/ and /'id-/ respectively, since the sequences Kyu and KyəC do not contrast with Kiw and KiC.

There are, however, a number of stems which begin with original y, all of the shape ya'C in Alaskan Haida, e.g. yá'ləŋ 'parents' (Sapir ya''g̱ɑlɑŋ), yá'n 'cloud' (Skidegate yan), yá'nəŋ 'fog' (Skidegate yanəŋ), yá' 'right at (there), straight towards (there)', yá'ŋəla' 'be easy'. There are also a few cases of opening of *hi to ya as above with *hu to wa, e.g. ya'á' 'be straight' (Skidegate (Kess) hig̱e), ya'wá' 'stretch legs' (Skidegate (Swanton) hī'xawa), as well as yahg^{w} 'middle', Skidegate (Levine) yah-gu or yax̣-gu, both < *(h)yax̣-gu < *hix̣-gu, as with wah-dá 'bark' above.[41]

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41. *hix̣- itself is probably derived from *hiɢ-, and thus perhaps related to *hiɢə 'straight'; compare further yah-dá' 'believe', yah-k'í' 'truth', yah-g^{w}dəŋ 'respect', yah-qá' 'govern', whence we can abstract yah- < *hix̣- < *hiɢ- 'straight, proper, direct'. The fate of syllable-final velar and uvular obstruents in non-prefix position is discussed below.

Thus, ironically, we are faced with the primary sequences *'wa on the one hand and *ya on the other, with initial w and 'y seen to be of secondary or foreign origin.

There is a clearer basis for distinguishing l and 'l. Initial 'l (like 'w) is only attested in the sequence 'la˙(C), e.g. 'lá˙, unstressed (h)əl 'third person specified animate', Skidegate (Sapir) 'la˙, 'lɑ, 'll; 'lá˙ 'good', Skidegate (Sapir) 'la˙; 'lá˙na˙ 'village, person or people of a place'; 'la˙nu˙ 'curse'; V+'la'á˙ 'V over again' (presumably < *'laɢə).

Initial l is attested in Chinook Jargon loans such as lá˙m 'liquor', ləmdú˙ 'sheep', ləble˙d 'preacher', and probably ləgú˙s 'mat'. Most probably native are lú˙ 'wave, swell', lá˙l'a˙ 'screen, partition', k'á˙lc'əda˙ lí˙ʒa˙ 'lichen'. This is, however, rather marginal basis for positing a historic contrast.

Of the nasals, all three are common syllable-finally, but initial m and ŋ are quite rare. Sapir, moreover, listed all three preglottalized initial sonorants 'm 'n 'ŋ. For 'm he cites 'ma˙ (exclamation of pain), 'madjɑ' 'ochre'; cf. however Alaskan Haida x̣éŋ'a˙ŋ məsdəgí˙n 'face paint' and (x̣əŋ'i˙) məʒá˙ '(face) is painted'. The latter is almost certainly a borrowing from Tsimshian: (Leer 1975) məs'aws (Boas mɛs'aus, Dunn [mɨs'aws], [mʌs'aws]) 'red ochre' (cf. masg 'red'). These attestations without preglottalization by transcribers who were fully aware of the existence of glottalized sonorants in Tsimshian cast serious doubt on the

preglottalization also of the Haida form of this item.[42]

For 'n Sapir gives ga''na 'bucket' and ta''na 'child', for 'bucket' Leer records ɢanə [ɢǎ'nɅ], i.e. low-toned, but without glottalization, Alaskan Haida ɢ æn. For 'ŋ Sapir gives 'ŋa'gɑ'ŋga'ŋ 'to vie with one another', which we have had no opportunity to verify. In view of the fact that none of these preglottalized nasals have been reconfirmed by later transcribers who were aware of the existence of preglottalized sonorants, and that Sapir's recording of 'ochre' conflicts with all available Tsimshian data, we have serious reservations about accepting Sapir's claim that such were distinct phonemes in Haida.

Stem-initial n is significantly more common, e.g. in nə 'house', ná' 'dwell', ná'n 'grandmother', nəŋ 'one', ní'ɬ 'drink', nú' 'octopus', nú'da' 'crowd, bunch'. Even a few sn clusters have been found: snə́l 'scab', Skidegate (Leer) snəɬ- 'scabby', and Skidegate (Leer) snən- 'small homely'. Outside of these, sC clusters are found only where C is a stop.

Syllable-final y and w are problematic. These sonorants have almost certainly evolved in part, or perhaps entirely, from syllable-final velar and uvular stops. This claim is based on two facts. First, no syllable-final uvular stops at

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42. Perhaps Sapir's informant, Rev. Peter Kelly, was aware that this word is a loan, and tried to make it sound more "Tsimshian" by preglottalizing the m.

all are found in Haida, and in all cases syllable-final g(^{w}) and k' in Alaskan Haida are attributable to these obstruents earlier followed by a vowel, as can be seen by comparison with Skidegate Haida, e.g. Alaskan Haida ƛəg, Skidegate Haida ƛəgə 'earth'; AH sʌəg^{w}, SH sʌəgu 'land otter'; AH ƛ'ək', SH ƛ'ək'i 'whetstone'. Hence the Haida of a century or so ago must have lacked syllable-final velar and uvular stops entirely. Second, by comparison with a few diffusions such as Haida nəw 'octopus', Tlingit na'ɢ^{w} 'octopus, bait' (also Gitksan (Rigsby) ʔnaχ 'bait', Kwakiutl (Boas) lōq^{u} 'to fish halibut') and Haida k'əy, Tlingit x'a'x' 'crabapple', it can be inferred that original syllable-final velar and uvular stops became w or y (depending on place of articulation and/or rounding) at some point in the history of Haida. These may have fallen together with original w and y, or quite possibly they are the sole source of stem-final w and y. Furthermore, the very common stem-final ɬ-l alternation found in Haida raises the possibility that at least some syllable-final l's are attributable to earlier lateral obstruents.

Thus, as far as can be ascertained for "pre-Haida" (using the label loosely, and discounting preglottalization), stem-initial possibilities were w l y (m) n ŋ, where syllable-initial m is quite marginal, and syllable-initial y w ŋ may have occurred in native Haida words only before a. Stem-final possibilities were (w l y) m n ŋ, where w l y may have been absent at some stage of Haida. If so, the distribution

of sonorants at this stage of Haida would have been strikingly similar to that posited for pre-Tlingit, where the only sonorants which could end a syllable were nasal.

In PA too we saw that of the non-coronal sonorants w m y ǫ, w and y were more frequent and/or stable in initial position, m and ǫ in final; thus in PA too final sonorants were predominantly nasal. Eyak tended to denasalize initials and lose the finals altogether. In PAE, however, final w and y may have been more frequent, later lost, though partly still in evidence through Athabaskan ablaut. We thus see that in this language area, the sonorant inventories tend to be quite similar, along with, not surprisingly, the consonant and vowel inventories. Moreover, the processes and changes they undergo tend to be similar. This is true whether the languages are genetically related or not. The relationships are, as we should by now expect, a complex mixture of convergences as well as divergences. (See Addenda.)

7.6.3 Tsimshian

In the Tsimshian sonorant system all members have glottalized counterparts:

w	l	y
m	n	
ẇ	l̇	ẏ
ṁ	ṅ	

In addition to the above, Coast Tsimshian has a sonorant virtually idential with Tlingit ɣ, derived from earlier x^w. An example is Coast Tsimshian la'ɣ, Nass-Gitksan la'x^w 'trout'.

All these sonorants apparently occur stem-initially, although some are evidently rare; in the available data, for example, Leer found Coastal Tsimshian word-initial l̓ only in the item l̓axˌ(s) (Boas, Dunn) 'needle', cf. Gitksan (Rigsby) se'l̓axˌ. Syllable-final glottalized sonorants undergo a process of "breaking" which, in coastal Tsimshian, results in a distinctive glottal modification similar to that found in Tongass Tlingit (here called "fading" and transcribed V̀ or V̀R), whereby the volume and pitch of utterance are abruptly lowered by opening the glottis after the first mora of the syllable. Hence to Nass-Gitksan (Rigsby) ma'y̓ [mæ''^{i}] 'berry' corresponds Coastal Tsimshian (Leer) ma'̀y [mæ'̀y], and to Nass c'al̓, Gitksan c'a'^{a} 'face' corresponds Coastal Tsimshian (Leer) c'al̀. The latter forms a minimal pair in Coastal Tsimshian with c'al 'cut fish', according to Leer; Dunn gives [c'al],[c'ʌl], and (Prince Rupert) [c'e'l], 'face; eyes' vs. [c'a'l], [c'ʌ'l] 'fillet fish'. At any rate, glottalized stem-final sonorants are not found in some Coastal Tsimshian due to this development.

It can be seen from this limited survey that virtually all the sonorants suggested above for Na-Dene on the basis of Athabaskan, Eyak, and Tlingit correspondences are found as well

in neighboring Haida and Tsimshian. More research is needed on sonorants in Haida and Tsimshian, and also on the vocabulary diffused amongst Haida, Tsimshian, and Na-Dene, which may reveal something of their interactions.

8. Retrospect on *ŋ

The original impetus for this paper were the considerations which led to the establishment of PA *ŋ. These now read, in retrospect, more than ever as a comedy of errors, worthy of at least brief chronicling. Where indications for *ŋ were obvious and simple, they were ignored, and where they were subtle and complex they were first noticed and "rediscovered" in the prefixes, but even there after some more obvious points were spectacularly missed.

As already noted (2.4.2), the first documentation of distinct reflexes of *ŋ in stems was in Mackenzie's 1793 Carrier wordlist (Mackenzie 1801), and further in Harmon's twenty years later (Harmon 1820). Variation between Carrier -y and a nasal is then explicitly described by Morice as early as 1890 (1891, 1932).

In some respects, Sapir's most amazing work on comparative Athabaskan was his earliest, especially his Chasta Costa. Here Sapir (1914.280-282) was already clearly aware of a prefixal and stem-final palatal nasal, which he reconstructs as PA *ŋ. "One of the most striking phonological characteristics of Chasta Costa is the disappearance of an original ŋ or of its representative, nasalization of preceding vowel.

Its former presence can always be proved by comparison with other Athabascan dialects that, like Hupa, still preserve it. In the case of all vowels but inorganic A, nasalization has left no trace whatever [in Chasta Costa], original ą̄ (from ā$_{\eta}$), ę̂ (from ê$_{\eta}$), and į̄ (from ī$_{\eta}$) being reduced to ā, ê, and ī;" e.g. "nā́/xe 'you paddle' (nā- = *ną̄-, cf. Hupa nûñ/ya 'you are about') ... łī 'dog' (original Athapaskan *łį̄, łi$_{\eta}$; cf. Hupa ⌊iñ, Montagnais l'in, Hare tl'in, Carrier łi, old form łœ^{n}n^{15})." In fn. 15 Sapir refers to Petitot 1876 and Morice 1891, and comments that "Carrier has evidently undergone a development parallel to that of Chasta Costa." Morice 1891 clearly has not escaped Sapir's attention. Sapir probably chose to represent the reconstructed phoneme η because of the Hupa η, though he is also fully aware that Hupa n:η does not reflect his PA *n:*η contrast: "Hupa -ñ (that is, our η) seems at times to correspond to Chasta Costa -n, but comparisons with northern Athabascan dialects indicates that in such cases we are dealing with original -n. Thus nAn 'you', despite Hupa niñ, is shown to have original -n by Montagnais nen and Loucheux nan;..." (1914.282).

In his treatment of Chasta Costa 2s subject prefix (1914. 314-315), Sapir gives many examples of its development as i or ī, as in t'íl/xwAθ 'you cough', dṓ/ī/se 'you do not cry', explaining that "this i-, ī-, is only secondarily the second person singular subjective element. The original element was doubtless -η- (cf. Hupa), which was reduced to nasalization of preceding vowels; the inorganic vowel [ə, Sapir's A], when nasalized, took on i- timbre...."

Sapir has the same hypothesis in his discussion of the perfective prefix (1914.319-321): "In the third person of definite tenses [perfectives] with second modal ŋ- or n- prefix [conjugation marker], this element is followed by ī, in case there is no third modal prefix present [Sapir is here referring especially to l classifier, '(e.g. yā/ɣál/gaθ 'he climbs')']. This goes back, without doubt, to nasalized -i- or -A-, in turn reduced from original -iŋ- (or -Aŋ-). This nasal element, characteristic of definite third personal forms (except such as have θ-, Athabascan s-, as second modal prefix) is found also in Hupa (-iñ-), Kato (-ûn-), and Chipewyan (-n-, -in-)," e.g. "yā/ɣī́/t!a 'it flies' (cf. Hupa na/win/tau 'it will settle down')."

Unfortunately, these are by far the clearest statements we have any record of by Sapir concerning his PA *ŋ. Sapir includes *ŋ in his inventory for Na-Dene (1915, passim), but not with the insightful exemplification of 1914. In his work of the 1920s *ŋ still occurs in Sapir's reconstructions of at least one stem, *-lin, *-lĕŋ 'to flow' (1923.140), but aside from that one item, also the only one I have noted in his comparative PA ledger, Sapir seems to have abandoned *ŋ. In his ledger, for instance, Sapir has *ɬe̋n(-k'-) for 'dog', *ɬán for 'many', *te̋nˣ for 'trail', -kˣàn' for 'husband', -te̋n' for 'bow'. For the two most inescapable cases of stem-initial *ŋ, 'earth' and 'you', Sapir in his ledger reconstructs doublets from a cluster *ny-. In the main entry for 'earth', he reconstructs "*ne̋ŋ (see also *ye̋n' < *nye̋n')"

citing Carrier yæn, Ingalik ñan' (Chapman), and ŋɪn˙ (from his own Ingalik data), and the other languages with n-; in the entry for "*yə̌n' 'earth' < *nyə̌n'; cf. nə̌ɳ" he cites Babine yɪ̌'n (Jenness) and Carrier yæn. He deals similarly with "*nə̌-ɳ; *nyə̌-ɳ 'thou'" (-ɳ = "heavy" n˙), where data with similar correspondences are listed. He clearly does not connect these with his PA *ŋ or make notice of similar correspondences stem-finally.

We have found no comments on Ingalik ŋ in Sapir's own 1923 Ingalik notes or his later writings: consecutively on one page of Haas's notes from his 1936 class, Sapir has reconstructed k̲ʼán 'rain' from data including his own Ingalik čǫ(˙)N, but also łán 'much, many' including Ingalik loŋ; Sapir's ledger shows these likewise, with data including Carrier tcan and ła̲y along with Ingalik tcʼɔ˙N and loñ.

Sapir's PA *ŋ remains in very low profile from his teaching in the 1930s. The only mention of it we have noted is on a set of 5 file slips in the Melville Jacobs collection, dated 1936 by Jacobs. One slip shows the 38 "Athabaskan Consonantal Phonemes (Initial)", including "ŋ (?)", and on the four other slips the Chipewyan, Hupa, Navaho and Sarcee reflexes are shown, with the reflex of *ŋ as n, the same as n, in all four. However, in the notes by Sapir's students in his comparative Athabaskan courses at Yale (Swadesh, Newman, Haas), there is no sign of any PA *ŋ; the second person singular prefixes are reconstructed with *n, and

we have noted no discussion of the PA form of the perfective prefix, once so interesting to Sapir. However, there is one comparison, "Tl. ɣɑ [classifier] = O in Ath. < *ŋə" (Newman notes, May 20, 1936), which shows that Sapir was still considering his *ŋ at the Na-Dene level, here correctly again for the perfective marker, this time in absolute initial position, with uncanny insight (see 2.3, 7.5, Krauss 1969.66-72).

There is, expectably, no mention of a PA *ŋ in the literature by Sapir's students Li and Hoijer, from the 1930s through the 1960s. Li and Hoijer considered the perfective prefixes to be *sə-, *nə-, and *ɣə-, the subject pronouns that occur with them having thus special (suppletive?) allomorphs, for which no phonological explanation was offered. In the third person (zero pronoun) with zero and ɬ classifier the nə- and ɣə- perfectives were observed to have an allomorph ní- and yí- in Navajo, nɬ- and ɣɬ- in Chipewyan, and nən- and wən- in Hupa.

The only person who recognized the perfective prefix proper during this period was Gladys Reichard, who studied Navajo from the 1930s and who in her Navaho Grammar (1952.131, 238-240, 246-7, 280-1) segments the perfective prefixes ni-ní-, yi-ní-, si-ní-, as yi- progressive, ni- inceptive, si- perfective, all plus -ní- "completive". However, her work was largely ignored, even reviled, by her fellow Athabaskanists.

Writing in 1967, Hoijer (1971.138-140) reconstructed the

PA perfective prefixes as *nən-, *ɣ^{w}ən-, *sə-, clearly understanding the origin of the Navajo prefixes with high tone. But he does not segment the final -n- of *nə-n-, *ɣə-n-, even though he was surely aware of the other prefixes of the same position as *nə- (imperfective) and *ɣə- (progressive), distinguished from those "perfective" markers only by the -n-.

Writing in 1968-69, Richard Stanley (1969.150-182) segments the Navajo perfective prefixes as underlying nə-n-, ɣə-n-, sə-n-, with -n- the actual mark of the perfective, deleted before d (d and l classifiers), and deleted also with the subject pronouns, after affecting their shape.

Heinz-Jürgen Pinnow shortly thereafter makes essentially the same point (1970.20, 1971.25-26), identifying the Navajo perfective prefix as ń~n~'.

Thus by 1971 a perfective marker -n- for Navajo and Athabaskan was becoming clearly discerned. At the same time, a -y- of related function and position was being identified in Tlingit, Eyak, and Athabaskan.

In 1964 Krauss (1965.17-19) had identified an -i- mark for the Eyak positive neuters and s-perfective, and optative. Four years later, Krauss (1969, especially pp. 56, 71-73) described what he called the "y-component" as one of the three components of the Tlingit, Eyak, and PA classifiers, occurring especially in Tlingit and Eyak (positive) perfectives and neuters, but only vestigially in Athabaskan, in the y- initial of the perfective form of the verb stem -a ~ -ya 'sg. goes'. Krauss

further formulated that in all three languages the y had occurred to the left of the (zero and) ɬ classifier, and as the -i- vowel in the vocalic classifiers də- ~ di-, ɬə- ~ ɬi-.

Pinnow comments (1970.63-67) that he would have the underlying form of the "y-component" as i rather than y. Strangely, neither Krauss nor Pinnow suggest any relationship between the Navajo-Athabaskan -n- prefix and this y-component.

Writing in 1972-73 Kari (1973), in contact with Hale and Krauss, identifies the Navajo perfective prefix now as -í- instead of -n-, though he explicitly recognizes it (Kari 1973.169) to be the same morpheme exactly as Stanley's -n- and Reichard's -ní-. Forty-six pages later he and Krauss (p.c. 1972, Kari 1973.216-218) consider the hypothesis that the -i- is related to the "y-component", but they still manage not to connect the -y- and the -n-, even pointing out that "the y-component analysis leaves the -n- of the Hupa and Mattole unaccounted for," thus readily connecting n with í (within Navajo, "n-absorption"), and í with y, then refusing to connect n with y! Writing in 1974 about perfectives and 2 sg., Kari (1975.345) does connect Navajo -í-, Tanaina -i-, Hupa -n-, Tanaina absolute initial n-, but reconstructs these as PA *n.

Finally in 1974 (Leer, p.c. to Krauss) the y and the n were connected as *ñ or *ỹ. This soon led then to Leer's identification (Kari 1975.345) of the absolute initial PA *ỹə- in the neuter adjectivals ; to the same for the second

person singular subject pronoun; to the identification of these with Eyak yi-; and to connecting all that with the stem-initials with Carrier y, other Athabaskan n, and stem-finals with Carrier y, Kutchin ɨ, other Athabaskan n; Krauss then remembered that Ingalik had ŋ which was still unexplained, and which he then found to coincide almost perfectly with the Carrier y. Many pieces began to fall into place with the recognition of PA *ŋ. We naturally looked for a nasal counterpart to *w, thought first we had found one in the initial of 'eye', but later realized that it was to be found instead in some of the items we had reconstructed with initial *ŋ, those which turned out to have labial reflexes in California. As we examined the PA sonorants as a system, we found that system to have greater complexity than we realized, but also that its dynamics explained puzzling correspondences, and particularly, as Leer discovered, ablaut in Athabaskan verbs.

We expect that much more can still be understood about sonorants in Athabaskan, Eyak, and Tlingit; as we have noted, stem-final and stem-internal sonorants are especially in need of further investigation, which we expect to be very helpful in advancing our understanding of the history of and relationships between Athabaskan languages, Eyak, and Tlingit.

9.1 Transcriptions

Transcriptions are generally adapted from the sources into a single standard technical orthography used here. Many of the sources are in phonologically adequate practical orthography or technical transcription, but some are in phonologically inadequate orthography (e.g. Legoff, Curtis) or even grossly naive transcription. These are nevertheless reinterpreted into the present standard, as this can be done with considerable confidence, at least for the present purposes, in identifying the reflexes of PA sonorants. Where desirable for any reason, transcriptions cited in their original orthography are underlined.

In the present transcription, affricates and fricatives are represented by unitary symbols, e.g. c for ts, ƛ for tɬ, θ̂ for tθ, ç̌ for tr, ş̌ for sr; long vowels as e.g. a˙, reduced as ɑ, constricted vowels as a̰˙; tone in modern Athabaskan languages is shown where marked (from PA constriction, see Krauss 1978, Leer 1979), V̋ in high-marked languages (e.g. Chipewyan), V̏ in low-marked (e.g. Sarcee, Apachean). C represents any consonant (obstruent or sonorant), X any obstruent, R any sonorant, N any nasal sonorant. Glottalized stops are represented e.g. t', c', and glottal stop as '.

PA reconstructions by now are to be considered as approaching rigorousness, the authors believe. The same might be said of PPA (pre-PA). Such reconstructed forms are represented

with a single asterisk. For PAE (Proto-Athabaskan-Eyak) reconstruction and above all PND (Proto-Na-Dene, i.e. Proto-Athabaskan-Eyak-Tlingit), the authors make no claim to rigor, but only approximations or speculations. Such forms are represented with double asterisk.

In PA constriction of vowels is marked as such in V̇(X), but not marked (as redundant) in V(R)'. PA *e˙, *a˙ were probably [ɛ˙, ɑ˙], or [æ˙, ɔ˙]. In Ingalik, Holikachuk, Koyukon, Upper Kuskokwim, Tanana, and Sarcee, where they are written a, o, they range between [æ, ɔ] and [a, o]. "Diphthongs" are written as vowel sequences in Kutchin, Navajo, and Chipewyan, but in other languages as VR; thus Kutchin dą̨i', -gą̨ih is phonetically identical with Han dą̨ỹ', -gą̨ỹ. In most Alaskan languages sonorants in absolute final position are voiceless, e.g. [V̥y = Vx̧], [V̥n] (Ingalik, Holikachuk, Upper Kuskokwim, Tanana), or breathy [Vy, Vy^{h}], [Vn, Vn^{h}] (Tanacross, Upper Tanana, Han, Kutchin), but in all these (except Kutchin) they are written simply with sonorant final; where they are phonetically fully voiced in absolute final position (always from *-Rə) they are written -y˙, -n˙, etc. Voiced "heavy" final fricatives and even stops occur in some of these languages also (again from *-Xə), where they are written e.g. -ð˙, -ʎ˙, -g˙. (Absolute final plain stops are written e.g. -ʎ, -g.) The symbol x̣ is dotted only in those languages which have a contrasting x or x̲; ɣ̣ is dotted only in PA. In our standardization here we have generally not made concessions to even well established orthographical conventions of specific languages,

with the main exception perhaps of Navajo (and Apache) tones, where to avoid any confusion, we have marked all vowels for tone, both high and low. In Sarcee we have marked both high and low, leaving mid or uncertain tones unmarked. In some of the more poorly documented Canadian languages (e.g. Sekani, Beaver), we have left uncertain tones or vowel lengths unmarked, but we are confident that such indeterminacy is not critical to any of our claims here.

Transcriptions of Hupa are for underlying phonological form, e.g. -nes 'long', not -nehs, nən 'you', not nəŋ, but are followed by surface phonemics in / / where instructive (e.g. -nawə' 'eye' /-na''/).

PA, Eyak, and Tlingit variable open verb stems are written CV; Eyak variable open verb stems with glottalized perfectives (-CV'-ɬ) are written -CV'.

For Tlingit, Tongass dialect forms are generally cited where available: CV˙ sustained, CV' glottalized, CV̀ with fading energy (somewhat similar to Eyak Vh); Tongass CV˙ and CV' correspond to northern Tlingit CV̀˙, and CV̀ to CV̀˙.

Haida x̣ is uvular in Skidegate, but pharyngeal in Northern Haida ([ḥ] in Masset, but in Alaskan an often somewhat trilled pharyngeal fricative). In Skidegate ɢ is [ɢ~ɣ̣]; in Northern Haida it is Masset[(')ʕ], Alaskan glottal stop affricated with the somewhat trilled pharyngeal fricative.

9.2 Abbreviations

The following abbreviations are used for language (and language group) names. The abbreviated forms are more often used in listings of data than in text, but not on a consistent basis. In citations of data, specific dialect designations follow in parentheses the language names, and specific sources follow in parentheses the cited form.

Ap.	Apachean	Ing.	Ingalik
At.	Ahtna	Kas.	Kaska
BR	Bear River	Kato	Kato
Brlk.	Bearlake	KAp.	Kiowa-Apache
Bvr.	Beaver	Koy.	Koyukon (L Lower, C Central, U Upper)
Cal.	California (any or all except Hupa, Tolowa)	Kut.	Kutchin
Car.	Carrier	K-T	Kwalhioqua-Tlatskanai
ChC.	Chasta Costa	Lassik	Lassik
Chil.	Chilcotin	Mat.	Mattole
Chip.	Chipewyan	Mesc.	Mescalero Apache
Dgr.	Dogrib	Mt.	Mountain
Eyak	Eyak	Nav.	Navajo
Gal.	Galice	NTu.	Northern Tutchone
Hag.	Hagwilgate dialect of Babine-Hagwilgate	Ore.	Oregon (including Tolowa)
Haida	Haida	PA	Proto-Athabaskan
Han	Han	PPA	Pre-Proto-Athabaskan
Hare	Hare	PAE	Proto-Athabaskan-Eyak
Hol.	Holikachuk	PND	Proto-Na-Dene
Hupa	Hupa	Sar.	Sarcee

Sek.	Sekani	Tol.	Tolowa
Sl.	Slave	Tset.	Tsetsaut
STu.	Southern Tutchone	Tsim.	Tsimshian
Tag.	Tagish	Ump.	Umpqua
Tahl.	Tahltan	UK	Upper Kuskokwim
Tl.	Tlingit	UT	Upper Tanana
Tna.	Tanana	Wail.	Wailaki
Tnc.	Tanacross	WAp.	Western Apache
Tni.	Tanaina		

9.3 Sources

Sources for Alaskan languages are mainly fieldnotes and files, including those for forthcoming major dictionaries, by Alaska Native Language Center staff (Krauss, Leer, Kari, Jones, McGary, and others) in the Center archives. For a descriptive catalogue of these holdings see Krauss and McGary 1980. Other important ms. materials for Alaskan languages and published sources, listed in the References (9.4), are as follows: Ahtna, Buck and Kari 1975; Tanaina, Kari 1977; Ingalik, Sapir 1923b, Kari 1978; Tanaina, Kari 1977; Koyukon, Jetté 1900, Henry, Hunter and Jones 1973, Jones 1980; Upper Kuskokwim, Collins 1964, 1972, 1979; Tanana, Krauss 1974; Upper Tanana, Milanowski and John 1979; Han, Ritter and Paul 1978; Kutchin, Petitot 1876, Sapir 1923c, Sapir, Haas and Golla 1964, Peter 1979; Tlingit, Naish and Story 1973, 1976. For Canadian Athabaskan languages sources are as follows: Southern Tutchone, McClellan 1963, 1975, McRoy 1974; Northern Tutchone, Ritter 1976, 1977; Hare, Rice 1978, Li and Hoijer 1960, Petitot 1876; Bearlake, Bloomquist 1975; Slavey, Morris 1977, Howard 1977; Dogrib, Petitot 1876, Howren 1975; Chipewyan, Petitot 1876, Legoff 1916, Li 1933, Li and Scollon 1977, Young 1938, 1939; Beaver, Young 1938, 1939; Sekani, Morice 1900, Young 1938, 1939; Tagish, Marsh 1953, McRoy 1974, Golla 1976; Kaska, Ritter 1978; Tahltan, Morice 1902, Thorman 1902, Hale 1965; Tsetsaut, Boas and Goddard 1924a; Babine-Hagwilgate, Kari 1973, Story 1978; Carrier, Mackenzie 1801, Harmon 1820,

Morice 1891, 1894, 1932, Young 1938, 1939, Walker and Wilkinson 1974, Cook 1976, Story 1978; Chilcotin, Morice 1883, 1890, Krauss 1975; Sarcee, Curtis 1928, Li 1930, Young 1938, 1939, Hoijer and Joel 1963. For Kwalhioqua-Tlatskanai the main published source is Boas and Goddard 1924, but those and further sources are described in Krauss 1973, 1979. For PCA sources are as follows: Umpqua, Tolmie 1841, Hale 1846, Harrington 1942; Tututni, Curtis 1924, Golla 1964b; Coquille, Harrington 1942, Hoijer 1960; Chasta Costa, Sapir 1914, Harrington 1942; Tolowa, Curtis 1924, Seaburg 1981; Galice, Hoijer 1973; Hupa, Golla 1964a,1965, Parsons 1971, Curtis 1924; Mattole, Li 1930; Bear River, Goddard 1929; Lassik, Essene 1942; Kato, Sapir 1907, Goddard 1912, Curtis 1925, Essene 1942; Wailaki, Curtis 1925. Apachean sources are as follows: Navajo, Young and Morgan 1980, Hoijer 1974, Haile 1950; Western Apache, White Mountain Apache Culture Center 1972, Hoijer 1930a, 1930b; Kiowa-Apache, Bittle 1956. Sources for Eyak are Krauss 1970, Rezanov 1805, Wrangell 1839. Early sources used here for Tlingit are Rezanov 1805, Veniaminov 1846, Krause 1885. Sources for Haida are Sapir 1923, Kess 1968, Leer 1974, Lawrence and Leer 1977, Levine 1977. Sources for Tsimshian are Rigsby 1967, Hindle and Rigsby 1972, Leer 1975, Dunn 1978.

For Tolowa, Mattole, Bear River, Sinkyone, Lassik, and Wailaki should be added Merriam 1979; see Addenda.

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10. Index of Proto-Athabaskan Stems

The following is an index, by page number, of the PA stems that occur in the text, arranged in the following alphabetical order: d, t, t', ʌ, ʌ́, ʌ', ɬ~l, ʒ, c, c', s~z, ʒ́(ʷ), č(ʷ), č'(ʷ), š(ʷ)~ž(ʷ), g, k, k', x~ɣ, ɢ, q, q', χ~ʁ; w, n, ŋ, ŋ$_2$, y, h (=Ø), '.

Where a reconstructed stem is not cited but is referred to in the text, or where reflexes of the stem or Eyak or Tlingit cognates of it are discussed, the page reference is in parentheses.

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Addenda

The following addenda were composed after the main body of the text was prepared for publication.

to p. 16

To this list should probably be added PA *-ŋ̲əʎ' 'throb': Ing. -ŋəʎ 'throb', Koy. -nəʎ, Tni. -nəʎ' ('swell, throb'), probably confirmed by Kut. nandjêl (Petitot, 'battre (poul[s])'); as with the preceding item, 'scoter', without PCA cognates or sporadic forms with u-type vowel, it cannot be determined whether the initial was *-ŋ̲- or *-ŋ̲$_2$-. However, cf. Eyak -wəʎ' 'jump startled, dodge, twitch'.

to p. 18 see addendum to pp. 135, 64

to p. 32 (2.1.2.3)

This highly problematical item may not properly belong under *h (=Ø) initial, both because (1) as noted, it is not attested with h initial in any language, and (2) it should not show n initial (as it often does here) after ɬ-classifier; *-ɬ-h- should yield -l- (as in 'handle pl.'). 'Win at gambling' (etc., note 'devour'), often O-nə-ɬ-, q^{w}ə-nə-ɬ-, indeed appears most likely to be the causative of the theme appearing in 'ten', listed as y-initial, p. 26.

Yet another stem of this type, perhaps related, is Nav. -yẽʾh/yè' 'gather, accumulate (water)', Sar. -yá(n-)/yàn 'sweat drops', Koy. n-na/no 'liquid drips, evaporates', Kut. n-heʾ/hąɬ 'flood, overflow'.

to p. 40 (2.3), 83 (5.1)

There may be another such suffix or another use of this same suffix in certain adjectivals derived from nouns, e.g.

particularly Car. də-ɣay 'hairy', At. də-ɣa'ni 'furred (garment)', < *-ɣa'-ɢ (cf. Eyak də-χu' 'be(come) hairy'), likewise Car. də-tu 'watery', Chip. ho-l-tun 'ground is watery', < *-tu'-ɢ.

Clearly, the PAE stem **-χaw̓ or the like had become -χa- by the PPA stage; otherwise, according to the preceding, the suffix (and then w) would have dropped. The same is true of the perfective suffix in e.g. 'bind', PAE **-ƛ'iw, but *-ƛ'u' already in PPA.

to p. 47 (2.3)

Two alternations of the type n-y also appear in the pronominal prefixes, which should be mentioned here, although the correspondences are quite different from those between n and y already noted.

(1) reciprocal object (and possessive) pronoun, outside of Alaska widely 'əɬ-, ɬə- or the like, apparently < *'əɬə-, but in Alaska generally niɬ-, including Ingalik, thus *niɬ-, and Eyak 'iɬ-.

(2) second person plural object (and possessive) pronoun (often, though not in Alaska, also serving in first person plural), generally reflecting *nəχ^{w}(ə)-, independent *nəχ^{w}ən(-i) or the like, in most Athabaskan, including Alaska, but Koyukon, Ingalik, Upper Kuskokwim yəχ^{w}-(ən). Tanana has both yəχ^{w}-(ən) '2 pl.' and nəχ^{w}-(ən) '2 paucal'; cf. of course '2 sg.' *ɢə- and *-χ^{w}- '2 pl. sj.' for potential analyzability, but cf. also Eyak ləχ-(i') '2 pl.', always with ləχ- even as verbal subject pronoun, < *nəχ(^{w})-.

to pp. 64 (3.1) see addendum to p. 135

to pp.72-73 (3.2)

For Tanaina -t'əm, also 'dense (of foliage)', cf. At. -t'en, Nav. -t'ìn 'dense (of foliage, etc.)'.

Here, as in some other cases (e.g. Carrier -čəm 'branch, knot', *-k̲ən 'stick') it is difficult to determine whether there was an original stem -Cəm with final widely delabialized, or whether the original was -Cən, occasionally labialized by special affective process as mentioned, p. 73.

to p. 83 see addendum to p. 40

to pp. 93 (6.1), 131 (7.2.3)

A PA cognate to Eyak k'əy̨'y 'other, different' (not of persons), may well be *k̲'ə-yu'- as reflected in Koy. k'əyu-yə, -nə, -na 'other thing, person, persons', similarly Tni. k'əyi-, Ing. gəye-, Car. 'əyu-n, UT č'ižon, č'ižu'y, Chip. -yu 'other', perhaps Nav. 'àyóí 'exceedingly'. Most striking is the Athabaskan reduction reflected in e.g. Car. 'ədən 'elsewhere', Tni. k'ədən, UT č'ədən, parallel to Eyak k'y̨h-da'- 'elsewhere' (for PA *-ən, Eyak -a, see p. 140).

to p. 94 (6.1)

or, more likely, PA *c'i'x̲, *c'u'x̲, *c'i'y̲ə, *c'u'y̲ə, where *y̲=*y; the unusual vowel alternation is perhaps indicative of a PPA disyllable similar to Eyak.

to pp. 98 (6.2), 108 (6.3.2)

For *(-)ʒəy̨^{w}əʌ' noun 'ball', verb 'play (catch, etc.)', see further Ing., Hol. ʒəyʊʌ, Chip. ʒolé, Nav. ʒǒ'ł 'ball', -ʒǒ'l, Hupa ʒə-wʊł 'be round like a ball'; also Tnc. -láh-ʒó'l'',

UT -lɑ̀h-ʒǫ'l', Han -lɑ̀h-ʒə̀' 'spruce cone', may belong here instead of with Ing. -dəŋəʌ < *-dəŋ$_2$əx̲-(ɬ); however, cf. also Koy. (Lower dialect) -ʒənʒəməɬ 'wart', < *-x̲əŋ$_2$əɬ, which may be connected to *-x̲əɣ̣^{w}əʌ'. (Cf. gəngəməɬ 'ringworm', addendum to p. 100.)

<u>to p. 100</u>

Note, however, also Koy. (C) gəngəməɬ 'ringworm' (noun only), and (L) ʒənʒəməɬ 'wart', for peculiar stems of this type, probably related. Clearly also some reduplication is involved. For the nasal part thereof, see p. 117.

To this list should no doubt be added Koy. (L) səməɬʌ 'snowshoe lacing needle', (C, U) 'oɣ bəɬʌ, the latter probably a reinterpretation of the disyllabic stem not yet elsewhere attested, presumably < *š^{w}əŋ$_2$əs-ɬ or the like.

<u>to p. 101</u>

M. J. McGary calls our attention to an important possible counterexample in Chapman's (Ingalik) Ten'a Texts and Tales (Leiden: Brill, 1914, p. 130, line 9), <u>nokhā'gwi tdĭ'mĭdzŭ</u> 'flat stones', probably not to be read -də-məʒ' and identified with -vəʒ 'broad, spread', but rather, as was done by contemporary speakers, contemporary Ingalik noqoɢəy' t'əʒ' 'flat stones, shale'. Cf. Ing. -t'əʒ 'flat', Hol. θ̂'ot'əsgə 'flat plate', but ðə'on' t'ʊsgə 'shale', Tni. (U) dnult'əyi (< *-t'əž-); Ing. -t'əʒ 'flat, smooth, (caus.) flatten', Koy. -t'ʊsg 'fall flat, (trans.) flatten, slap', Tna. -t'ʊs 'slap' (unique -s final, < *-t'ʊš-g), UK -t'us 'slap', Tnc. -t'əs 'slap', probably also Han, Kut. -t'an 'slap', Kut. -ɬ-t'an

'smash flat', -t'ɬą' 'flat', Hare -t'u 'hit, punch', Chip. -t'us 'punch', thus further Nav. -t'ɬž, -t'ɬš 'strike a glancing blow' (Young and Morgan), 'hit with blunt object' (Hoijer), Mat. -t'ix 'drive sticks into riverbed', Hupa -t'əW 'pound with wedge or chisel', At. -t'ez, -t'i's, Tni. -t'əž, -t'iš 'shoot with arrow, split wood', Koy. -t'əs 'split with wedge', Hol. mək'it'əz' 'wedge', thus back to Ing. -t'əš̩ 'split wood', and -t'əš̩ (pf. -t'əɣ̓) 'slap', this last showing doublet with retroflexion not only, as expected, with spirantized final after loss of repetitive suffix *-g, but also in pf. -t'əɣ̓, apparently a back formation. This whole group is evidently connected, e.g. with ʌ or u vowel in Koy., Hol. (some forms), Tna., UK, Hare, Chip.; *ʊ necessarily >ə in Ing., Tni. (but not in the others); and a nasal in Kut. and Han. These imply something like PA *-t'əməɣ̓, but the Ingalik especially, -CəməX, contrasts with e.g. 'tickle', -CəŋəX. Perhaps the difference is due to PA internal *-w- as opposed to *-m- (though Han has nasality in both 'slap' and 'tickle') in one or the other, and/or of course the difference may be due to other factors. In any case it is not clear that Ingalik has generalized all disyllabic stem-internal sonorants as -ŋ-. We may perhaps hope that enough data can be assembled some day to clarify some of these forms and processes.

Sapir (ledger) reconstructed 'to strike with the fist' -t'uc and (Kutchin) *-t'ĕn̨, connecting these together also with Tlingit -t'ätc 'to slap', with the remarkable (Na-Dene?) reconstruction *-t'ʷànc; cf. Tl. -t'aɣ̓ 'clap, slap, swim',

but also -t'ag 'dent, press, slap, hit', and -t'ug 'shoot with arrow'.

to p. 108 see addendum to p. 98.

to p. 123

Some constraints should probably be stipulated for these rules. Especially the first, Nasalization, may have operated only optionally or locally, hence the varied initial reflexes of *RVN. This rule should no doubt also be broken down into a sequence of two rules, the first *V → V̨/__N (of wide general application), and the second R → N/__V̨.

The second rule, Weakening, should probably be adjusted to exclude final *-n; i.e. *Vn, *Vm, *Vŋ are *V̨', *Vw̃, *Vỹ before obstruents, and *Vm#, *Vŋ# are *Vw̃, *Vỹ, but *Vn# remains in PA, as in PAE. (In Eyak, however, *Vn > V̨', V'; see p. 140; but in Tlingit, -n is stable, as in PA, see addendum to p. 155.)

to p. 131 see addendum to p. 93

to pp. 135 (7.3.1), 18 (2.1.1), 64 (3.1)

To this should also be added Mat. -bod 'boil'; all PCA forms presumably < PA *-wɑd. (Nav. bè'dí 'cooking utensils' is difficult to connect, due to low tone from constriction, and vowel timbre; < *wè'd-, perhaps 'with it - eaten(?)'.) In the absence of attestation outside PCA, another possibility might be *-ŋ$_2$ɑd, but Tolowa should not have labial for *ŋ- unless /__VN (n in 'wedge', 'spill', but m in 'across'). Eyak -'mahd (< *-'wąhd) in fact suggests PAE **-'wand, but the reduced vowel in Athabaskan would require the

absorption of the nasal before the PA stage. The alternate possibility of PAE **-'$\underline{ʔ}_2$and is of some interest, as it would be the only other instance so far identified of *'$\underline{ʔ}_2$- besides *-'$\underline{ʔ}_2$əɬ 'pour' (speculatively thus in Eyak PAE **'$\underline{ʔ}_2$əX (› 'yəX) › 'iX, but **'$\underline{ʔ}$aN/__X (› *'wą-) › 'ma-, alongside **$\underline{ʔ}_2$- › w/__VX, › m/__VN, as in 'wedge' and 'lake', i.e. labiality lost only where not followed by nasality, as in Oregon.

Although the Tolowa reflexes of stem-initial *w are very predominantly m, not b, the doublet -bəd along with -məd seems to have some parallels, e.g. in 'gull', Curtis <u>pá-sĕ</u>, confirmed in Merriam (1979) <u>Pah'-shrĕ</u>, probably cognate with widespread Northern *we'ɬ. The b of 'housefly', Merriam Tolowa <u>Pun'tn̲</u>, is of different origin, not a possibility here (see 3.2, fn. 18).

The authors received Merriam's California biota lists (Indian Names for Plants and Animals among Californian and other Western North American Tribes, by C. Hart Merriam, assembled and annotated by Robert F. Heizer, Ballena Press Publications in Archaeology, Ethnology and History No. 14, Socorro, NM, 1979) too late for consideration in the main body of this paper. The lists contain interesting supplementary Californian data for some of the forms treated in this paper, but we have not noted any data which conflict with what we have here; the Merriam lists rather confirm and supplement, not only the Tolowa, Hupa, Whilkut, Mattole, Bear River, Lassik (three lists), Wailaki (two lists) and Kato, but include two Sinkyone lists, which confirm e.g. that

the development of stem-initial sonorants there too was as in the rest of (non-Hupic) California. E.g. for 'flicker' Merriam includes Mat. Chĕ'-ho-bel'litch-cho', Chĕ-ho-bel', BR Chĕ-ho-bel', Lolangkok Sinkyone Mun'-chis-bŭl, Southern Sinkyone Ben'-chis-bŭl, Lassik Mun-chis'-bul, Eel River Wailaki Min-chēs bil'-cho, Kato Buntch'-bul. The Mat. and BR [čəx^{w}ə́bə́l] are interesting in showing no prefixes, like some of the Northern forms. The Sinkyone, Lassik, and Wailaki show that there were at least some variants there also in which *w > m beside b in prefixal *wə-/__N.

This variation, common also in the North, adds yet another position (2b) to those which must be distinguished in charting the development of sonorants: 1a. Stem-initial /__V(X), 1b. Stem-initial /__VN, 2a. Prefixal /__VX, 2b. Prefixal /__VN, 3. Stem-final, 4. Stem-internal preconsonantal (CVRX, similarly perhaps prefixal preconsonantal), 5. Disyllabic stem-internal (CVRəX).

to p. 155

To the list of final sonorant correspondences should be added PA(E) **-n : Tl. -n, as in PA *-ta'n 'classificatory long object', Eyak -ta, Tl. -tan; PA *-he'n 'sg. stands', Eyak -ą'', Tl. -han; PA *-wa'n'- 'edge', Eyak -wa'-ł, Tl. -wan. Thus **-n appears to be the most stable of the final sonorants, remaining as such in both PA and Tlingit. The non-coronals are less stable, the velar or palatal (certainly **ŋ, perhaps also **y) being retained in PA, partly lost in Tlingit (Tl. -y < *-ŋ, but without clear PA(E) cognates); but **-w perhaps the reverse, sometimes retained in Tlingit where lost in PA.

to p. 164 (7.6.2)

We presently believe that unlike Tlingit, and like Tsimshian, Haida has not proven genetically relatable to Athabaskan-Eyak. See discussions in Krauss, "Eskimo-Aleut and Na-Dene" in Lyle Campbell and Marianne Mithun, eds., The Languages of Native America: Historical and Comparative Assessments, Austin and London, 1979.841, and especially Robert Levine, "Haida and Na-Dene: A New Look at the Evidence", IJAL 45.157-170, 1979, for a systematic critique.

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